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Engineering Exports

THE loss of ground in United Kingdom engineering exports, to which attention is drawn in the latest issue of the Treasury *Monthly Bulletin for Industry*, is a timely reminder of the need to give increasingly close attention to overseas marketing problems. Comparisons are made in the *Bulletin* between engineering exports from the United Kingdom, the United States, and Germany, in which it is shown that the annual rate (in value) compared with 1951 has fallen by about 3 per cent in the first five months of this year in the United Kingdom, while remaining unchanged in Germany, and going up by 3 per cent in the United States. These are annual averages, and the rate for the first six months of this year in United Kingdom engineering exports is actually 3 per cent higher than in the second half of 1952, a result partly accounted for by price changes. In some branches of railway material the figures for January-June this year compare favourably with the corresponding period of 1952. Wagon exports, for example, reached £5,441,057, an increase of nearly 46 per cent, while wheels, tyres, and axles were exported to the value of £3,185,128, an increase of some 33 per cent. Railway and tramway constructional materials exported for the six months totalled £6,192,831, or in the region of 40 per cent more. Against these increases, locomotive exports were virtually stable, being £5,933,800 in January-June this year and £6,002,168 in the same period of 1952, although railway carriages declined from £2,410,593 to £1,705,484. Machine tools have shown increases in the main both in the quantity and value of exports, values for the first six months being £8,741,589 in 1951, £11,541,841 in 1952, and £12,059,851 in 1953. The keen competition prevailing has naturally directed close attention in all countries to Governmental or other practices thought to favour local manufacturers, and the discussions of export subventions of all kinds likely to take place at the Organisation for European Economic Co-Operation next month could stimulate effort if they were to ensure that competition was on more equal terms. The situation has been well summed up recently in Mr. W. J. Ruston's statement to shareholders of Ruston & Hornsby Limited, when he said that the retention of overseas markets and the limiting of costs have become national problems.

Irish Railway Board

AFTER prolonged negotiation, finalities were reached in Belfast on August 10 when Mr. Sean Lemass, Irish Minister for Industry & Commerce, and Mr. William McCleery, Northern Ireland Minister of Commerce, signed the agreement under which the Dublin and Belfast Governments acquired the 114-year-old Great Northern Railway for £4,500,000. The board of the new undertaking consists of ten members, five being appointed by each Government. The two senior members of each side will function as Chairman and Vice-Chairman respectively each year in rotation, and it is expected that Mr. George B. Howden, the senior Member of the Northern side, who has had a wide experience in transport in both Northern Ireland and the Republic, will be the first Chairman. The full composition of the Board, which has been appointed for four years as from September 1 of this year, is given elsewhere in this issue. A prerequisite of appointment from Northern Ireland is membership of the Ulster Transport Authority, tenure of office being four years or so long as U.T.A. membership is retained, whichever period is the shorter.

End of British Railway Interests in Argentina

ON July 31 the Liquidation Committee of the British-owned railways in Argentina ceased to exist, bringing to a close a ninety-year-old participation of British enterprise and investment. The liquidators pointed out that as they had reached the end of the final stage of the task with which they were entrusted under the terms of the sale and purchase agreement of February 13, 1947, legal and commercial representation of the companies in liquidation was no longer necessary. Mr. Robert Montgomery, head of the committee, added that a comprehensive and equitable solution of all questions had been reached in spite of the difficulty and complexity of the task. At the request of Sir Bernard Binder, chief liquidator of the companies in London, a farewell cocktail party was held in Buenos Aires for members of the Argentine Government by Mr. Montgomery and Dr. Gerónimo Cortés Funes, his fellow liquidator in Argentina. Tribute was paid at the function to the part played in drawing up the sale and purchase agreement by Sir Montague Eddy, the last Chairman of the Buenos Ayres Great Southern and Buenos Ayres Western Railways, and Señor Miguel Miranda. It transpired that only 25 British-born employees remain in service on the Argentine railways. The Minister of Foreign Affairs, Dr. Jerónimo Remorino, said that the part played by British investment and enterprise over such a long period would not be forgotten.

Railway Link to New Capital of Punjab

FOUNDING new capital cities during the railway age seldom has necessitated much railway construction. The building of New Delhi caused deviation of a main line to avoid the site, but despite provision of a New Delhi

Station much traffic for the Indian Federal capital continues to be handled at the passenger and goods stations serving Old Delhi. A short length of Commonwealth-owned line had to be built to link Canberrra with the New South Wales Government Railways. To serve Chandigarh, the new capital of the Punjab, the population of which is expected within three years to reach 150,000, the Indian Railway Board last month approved construction of a ten-mile diversion line through the new city, and work has been put in hand. The new line is to connect with the Ambala-Kalka line of the Northern Railway, which is treating this as a high priority project. The monsoon is likely to retard speedy construction, and another unfavourable factor is the shortage of essential materials such as cement and steel. The work is expected to cost some Rs. 800,000-1,000,000. Station buildings at first are to be constructed to austerity standards and improved later as the new city increases in extent.

Encouraging Fuel Economy

SOME of those who rush to join in arguments on such sweeping measures for saving fuel as railway electrification and conversion to diesel power, are themselves guilty of causing insidious waste by forgetting to switch off lights or by leaving hot water taps running. In an effort to focus attention on these little matters which may add up to be so large a drain, British Railways are offering prizes for poster designs urging economy and efficiency in the use of fuel. Artistic ability is not essential, for money prizes will be given for the effectiveness of the idea or slogan. All employees of British Railways are eligible. Besides the first three prizes, there will be awards for any other design used as a whole or in part as the basis of a poster. The broadcast nature of this call for ideas emphasises that fuel saving is a universal responsibility, and that those whose inspiration fails to respond to the present call can none the less play their part by giving thought to the avoidance of waste of fuel in any form.

Stock for Mexican Diesel Trains

SPECIAL rolling stock has been built in Switzerland for forming diesel-hauled "Aztec Eagle" expresses between Mexico City and the U.S.A. frontier at Laredo, a journey of 810 miles which will be covered in about 20 hours with two 1,500-h.p. locomotive units at the head of each ten-coach train. These vehicles, described on another page, are of Schindler lightweight all-welded stressed skin construction and have bogies of the Swiss type with axleboxes mounted in hydraulic damper assemblies suspended by helical springs, ordinary axlebox guides not being used. Each train will be composed of ten coaches, including restaurant and sleeping cars and a baggage-postal van. The interior appointments are modern and luxurious in style, and full air-conditioning is applied. All vehicles except the baggage-postal vans have fluorescent lighting. The illustrations accompanying the article in this issue show the uniform illumination obtained by this system and the successful manner in which the lighting fittings can be incorporated with modern interior design schemes. An interesting device is the housing of lamps in the luggage rack supports, seen in the interior view of the first class coach. The short lamps imposed by power supply limitations in rolling stock are actually an advantage from the point of view of harmony with decorative features.

A Case of Brake Failure

THE circumstances of the fatal accident at Guildford on November 8, 1952, were most unusual. As will be seen from our summary of Brigadier C. A. Langley's very documented report, a compressor had been put out of action on a two-car electric train set without the fact being noticed and resulted in a gradual loss of air, likewise unobserved by the motorman, ending in the train getting out of control on the down gradient approaching from Aldershot and colliding with a light engine after overrunning all signals. Save for the blown fuse, which stopped the compressor, nothing could be found wrong with the brake equipment and the conclusion was that the motorman had become so accustomed to dependability of the brake that he had got out of the habit of watching his gauge needles. It was noticed that several of the spotlights provided to illuminate the gauges at night did not function effectively and this, which some motormen admitted they had never bothered to report, might have contributed, Brigadier Langley thinks, to neglecting to read the gauges. Such an accident can be prevented in future by fitting train pipe governor valves, so that no power can be obtained unless there is sufficient pressure therein, and this is now to be done.

Brake Failure Inquiries

THIS is the first case of a Ministerial inquiry being held into the failure of the continuous brake on a passenger train composed of electric stock on which it had been acting apparently correctly on the journey hitherto. There was, however, an inquiry, conducted by the late Sir John Pringle, into a serious buffer stop collision which occurred on November 18, 1909, at Ealing Broadway, District Railway, when an empty train, which had come from Ealing Common Depot very early in the morning, clearly had had no air brake operative from the start and ran into the station at considerable speed, with destructive results. The front guard was killed and the motorman fatally injured. There was some contradiction in the evidence and it was possible to advance more than one suggestion as to how the situation came about, but it was proved that the train was in good order when originally stabled for the night. Sir John, then Major J. W. Pringle, concluded that there was no air in the auxiliary reservoirs or train pipe at the time of the collision and the train had been started from the depot with no effective brake test. At the last moment the motorman had attempted to reverse, but could not have failed to see the seriousness of the situation earlier had he observed the pressure gauge. The guard, too, clearly had failed in his duties.

Locomotive Coal Consumption

THE test bulletin issued by British Railways a month or two ago on the class "7" Pacific locomotives does not seem so far to have elicited much discussion, though the optimum coal consumption of 1·5 lb. per i.h.p. hr. and 2·0 lb. per d.b.h.p. hr. shown by the charts must be the lowest ever recorded with a two-cylinder simple steam locomotive. Indeed, the first reaction of the cynic will be to recall the "Royal Scot" tests of 20 years or more ago, and wonder if the dynamometer car still reads 10 per cent high. The lowest previous consumption we can recall with a two-cylinder simple is 1·73 lb. per i.h.p. hr. with the Alsace-Lorraine 4-6-2 engines with Kylchap exhaust and poppet valves, and with coal of about the same 13,800 B.Th.U. per lb. heat value as with British Railways class "7" engines. The four-cylinder compound 4-6-2 engines of André Chapelon, of the Paris-Orleans Railway in 1932-35, showed an optimum consumption of 1·5 lb. of coal per i.h.p. hr. with 13,500 B.Th.U. coal, and a year or two later his celebrated 4-8-0 four-cylinder compounds gave 1·35 lb. per i.h.p. hr. of 13,500 B.Th.U. coal as the optimum figure; and as far as we know this is still the best ever except for the short-lived triple-expansion 4-8-0 of the Delaware & Hudson.

Locomotive Thermal Efficiency

THE coal consumption figures given above draw attention to thermal efficiency, in which the steam locomotive is notoriously deficient. Some 120 years ago drawbar thermal efficiency of coke-burning locomotives scarcely rose above 1¼ per cent. Nearly 50 years later early compound locomotives gave 5-5½ per cent; and in 1897-98 the first Schmidt highly-superheated locomotive showed a drawbar thermal efficiency of 6½ per cent, or one-twelfth

more than the previous best, though it must be said that this locomotive did not have the modern multi-flue form of superheater. By 1913-14, better understanding of compounding and superheating, *plus* improved construction of piston valves and other details, had brought drawbar thermal efficiencies on test runs up to 8 or 8¼ per cent, and in the late 1920s German four-cylinder compounds increased this to 9·5 per cent. The curve was then flattening out, and much more effort and skill was needed to get each succeeding ¼ per cent, though eventually Chapelon managed in his 4-8-0 test runs to get up to 11¼ per cent with four-cylinder compounds, 285 lb. pressure and 400 deg. C. steam temperature. Apart from the Delaware & Hudson triple-expansion experimental locomotive with 12 per cent, Chapelon's figure has not yet been exceeded.

A Warning to British Manufacturers

A WARNING that South Africa might place locomotive and rolling stock orders elsewhere if British builders could not improve delivery dates, even although their prices might compare favourably with others, was given last week by Mr. Paul Sauer, South African Minister of Transport. He was presenting the railway budget in the House of Assembly. Unless manufacturers in Great Britain could show that they could execute orders "even approximately on dates promised," he said, the Administration would have to consider carefully the advisability of continuing to allocate tenders to them, despite the price factor. Large orders for locomotives and vehicles were regularly placed, but on occasions objectives were thwarted through exceptional delays in the execution of them; these delays, he added, adversely affected the South African Railways plans for re-allocating motive power. As the penalty clauses in contracts had virtually fallen into disuse since the war, there was little more they could do in exercising pressure on manufacturers.

Specifying the delivery delays which had occasioned his warning, he mentioned class "4" electric and class "25" steam locomotives from the same British firm. Delivery of 40 electric locomotives ordered in September, 1948, was promised to start in the first quarter of 1951, at the rate of three a month. The first locomotive was delivered more than a year after the promised date, and since then delivery had been maintained at barely half the promised rate. Mr. Sauer quoted similar delays with class "25" locomotives. Delivery of an order for 100 locomotives and 40 tenders placed with the same firm in November, 1951, should have begun in November, 1952, and been completed in December this year, but only three out of the 100 locomotives had been received so far, and it was doubtful whether the order would be executed completely by the end of 1954.

No reason has been given for these delays. It may reasonably be assumed that the cause is circumstances outside the manufacturers' control. Shortage of materials may have contributed. This affects the supply of skilled labour, as men unable to work at full output rate, with consequent loss of bonus, can find better-paid work in the locality. There has been a shortage of steel plates, for instance, which now has been largely overcome. The locomotive and carriage and wagon building industries, like all heavy industry in this country, is so nicely attuned to intensive production that with order books full, and with a backlog accumulated from the period when materials were in short supply, a relatively slight shortage of material or a defect in works organisation, which would be less serious where production is less intensive, may cause delays. Important factors in favour of punctual deliveries of locomotives and rolling stock overseas have been the co-operation of the Government in allocating materials to what it recognises as a vitally important export industry, and the efficiency of the British steelmakers. One reason why builders in some other countries have been relatively free from delays in delivery is their entry or re-entry late, since the war, into the field of locomotive and rolling stock manufacture; commencing with clear order books and with relatively few orders in hand, together in some cases with re-equipped factories as a result of the war, honouring of delivery dates has not been such a problem as in this country.

Whatever the reason, however, the need to take heed of Mr. Sauer's words remains. His allusion to the importance of delivery dates in relation to prices is of the utmost importance. For a century the good quality of British railway material exports has been unquestioned. The several firms have had unrivalled opportunities of studying their markets and British builders between them have accumulated unsurpassed knowledge and experience. Price, where the advantage recently has been and still is with the British manufacturer, largely is a matter of foreign exchange. There is no certainty, even although British firms maintain a lead over foreign competitors in keeping down production costs, that their prices will continue more attractive.

Other factors in favour of foreign builders are the reconstruction and rehabilitation loans which some Governments are prepared to make, and the greater credit facilities for buyers in some foreign countries than in the United Kingdom, despite some relaxation in the British Government attitude in this matter. With increasing degrees of self-government in different parts of the British Commonwealth, there may in those territories be a decreasing tendency to turn to Britain for railway requirements. Industrial development is making rapid progress in many countries, and stiffer competition for orders for railway material may be expected from Continental and Japanese builders. If British manufacturers of locomotives and other railway material, and indeed of other capital goods, are to hold their own in markets where they are in direct conflict with foreign competitors, they must not lag behind in the essential matter of punctual delivery.

Timetable Display

A DESIRE to make the best possible use of wall space on station premises for display of posters and other matter thought more likely to produce revenue than timetables, difficulty in finding space for display in stations where traffic has grown without the possibility of rebuilding, and a feeling that the public cannot or is disinclined to study timetable sheets probably are the reasons for apparently increasing difficulty in finding timetables displayed in British Railways stations. It is seldom that the sheets cannot be found fairly easily showing the trains serving the station concerned. Even then, however, they are not infrequently in inconvenient positions: sheets of up trains on a down platform, or displayed on an exposed outer wall instead of in the booking hall or general waiting room or on the platform, or above a seat so frequented that access is impossible.

The tendency not to display timetables prominently probably is connected with that of passengers and station staff not to use them. In smaller stations all the sheets giving services of the Region concerned sometimes are not shown. If Regions generally are larger than the railways before 1923, when all the passenger timetables of the company concerned normally were shown in all its stations, timetables tend to be more compressed, with a multiplicity of services, formerly shown separately, on each sheet; there have, moreover, been many withdrawals of branch-line and secondary passenger services in the past thirty years, which has reduced the amount of timetable space. The result is that the inquirer at a station must ask the staff. In a large station this means asking the inquiry office, which at holiday periods may mean queueing to ask a question which could be answered instantaneously by referring to a timetable. In a smaller station it may mean troubling a busy booking or parcels clerk. The reason for this may well be that the travelling public wishes to consult timetables less than it used to. Those apt in reading *Bradshaw* and timetables generally are fewer, and such persons tend to travel by private car or aeroplane. With the spread of education, there seem to be fewer helpless travellers; but the increase

in bus and motorcoach travel and the creation by paid holidays of a new travelling public have delayed that sophistication in railway travel which might have been expected.

Advantages and amenities of travel which the railways can open in competition with other forms of transport, such as speed in transit, refreshment and sleeping-car facilities, and non-stop runs are those which are apparent in timetables. To save wall space, more might be done at stations to exhibit them on hinged metal sheets fixed to uprights, as on the Continent. This, however, cannot publicise the speed and other amenities obtained, which might be done in part by return on a larger scale to the prewar practice on some railways of publicising abstracts of express train timings in poster form.

Improvements in Brazil

THE Brazil-United States Commission for Economic Development, appointed in December, 1950, has completed its work and is being dissolved. It has initiated 41 priority projects calling for an investment of 21,200 million cruzeiros (£424,000,000)—7,700 million (£154,000,000) in foreign currencies. Loans totalling U.S. $132,700,000 have been approved and negotiations for others amounting to $41,300,000 are almost concluded. The projects already being carried out entail a total expenditure of 6,000 million cruzeiros (£120,000,000). The following projects recommended by the Commission have been approved by President Vargas, the sums in brackets representing in U.S. dollars the foreign loan required to finance imports: Santos-Jundiai (8,548,000); Paulista (6,801,000); Central (12,500,000); Parana-Santa Catarina (16,886,000); Rede Mineira de Viacao (7,041,000); Noroeste (6,354,000); Central Railway suburban lines at Rio de Janeiro (12,500,000); Leopoldina (5,334,000). The improvements on the Leopoldina Railway will require an additional expenditure of 706,322,000 cruzeiros (£14,000,000) in Brazilian currency. The new material to be acquired includes 530 km. of rails, complete maintenance equipment for 240 gangs; 770 36-ton steel wagons; air brakes and automatic couplings for 74 locomotives; 100 steel coaches (to be built locally); and repair-shop equipment. Because of price fluctuations the loan to the Paulista no longer covers all the imports originally scheduled. Cast and forged steel products will therefore be manufactured locally, and chain couplings and automatic brakes will be replaced by automatic couplings and compressed air brakes only on broad-gauge stock.

Tasmanian Government Railways

THE report of the Tasmanian Transport Commission for the year ended June 30, 1952, which we have received from Mr. C. E. Baird, Commissioner for Transport, shows a loss on all its operations of £732,903, but there was a record railway deficit of £962,128. Three pages at the beginning of the report are devoted to the reasons for this and other annual losses. Profitable working is limited by the rugged nature of the country, involving costly construction, maintenance, steep gradients and sharp curves. Although the average freight haul has risen from 47 miles in 1938-39, to 96 miles in 1950-51 and to 103 miles in 1951-52, the volume of paying traffic is light, as the large towns are on the coast, and they obtain many of their supplies from the mainland. Moreover, there is no hinterland from which raw materials can be railed to the coast, and there is no concentration of production on a capital city. The population, moreover, is small and is mostly in the coastal towns.

The railways were largely constructed for developmental purposes without financial justification, and branch lines have outlived their contribution to the welfare of the State; some have already been closed. Earlier Governments starved the railways, which consequently were badly located, built, and maintained. The western and main lines were purchased from private owners at unduly high prices, and practically had to be rebuilt to meet modern traffic conditions. More recently equipment was allowed to deteriorate seriously and, though the Transport Commission in its first year of operation, 1939-40, halved the annual loss, the war prevented much-needed rehabilitation. Since 1938-39 salaries and wages have increased by 304 per cent and the cost of materials by 300 per cent, whilst rates and fares have risen by only 120 per cent. In fact, of the £514,682 increase in expenditure between 1950-51 and 1951-52, 82 per cent is accounted for by a precipitate rise in wages.

The heavy annual losses sustained are certainly due neither to the railways losing traffic rapidly nor to their becoming obsolete in other ways. On the contrary, tonnages moved have risen greatly, and the handling of traffic is increasingly efficient. The percentage increases of 1951-52 over 1938-39 quoted below clearly prove these points:—

	Percentage increase
Net ton-miles of goods carried	133
Average load per train-mile	271
Average density of goods traffic per route-mile ...	150
Revenue per train-mile	239
Average capacity of wagons	41

To reduce the railway loss the Commissioners decided in the year under review to raise fares by about 20 per cent and rates by from 10 to 15 per cent, increases that were expected to realise some £22,000 and £160,000 additional revenue, respectively. Enquiries were also being instituted into the possibility of closing more branch lines, and of effecting additional operating economies.

The following are some of the principal results of working in 1951-52 as compared with those in the previous year:—

	1950-51	1951-52
	(Thousands)	
Passenger journeys	3,182	3,187
Passenger train-mileage	917	895
Goods & mineral tonnage conveyed ...	861	889
Goods ton-miles	79,915	88,696
	(£ thousands)	
Passenger revenue	168	177
Goods traffic	1,018	1,539
Total operating revenue	1,357	1,808
Working expenses	1,857	2,389
Loss on working	501	582
Interest and depreciation	330	381

Of the 895,394 total passenger train-miles run, 563,552 were railcar train-miles, or nearly two-thirds.

Nine diesel-electric, 2 diesel-mechanical, 8 " H " class and 8 " M " class steam locomotives were placed in service during the year. Orders were placed for 32 diesel-electric and 6 diesel-mechanical (shunting) locomotives, as well as for 10 passenger and 8 goods steam locomotives. Construction of the new Hobart Station was well in hand.

During the year the death occurred of Mr. A. K. Reid, General Manager of Railways and Associate Commissioner. He was succeeded in these posts by Mr. C. G. C. Wayne.

Transport in the Lower Congo

ALTHOUGH the inauguration of 50-cycle electric traction between Jadotville and Tenke has directed particular attention recently to the Bas-Congo-Katanga Railway, by far the largest system in the Belgian Congo and linked with the Rhodesia and Angola railways, there is a considerable mileage of unconnected lines in other parts. Otraco (Office d'Exploitation des Transports Coloniaux), a subordinate of the Belgian Ministry for the Colonies, but now financially independent, operates three lines: Matadi-Leopoldville; Mayumbe; and Kivu, of which the first, 227 miles long, is the most important. It is the oldest in the colony, having been opened in 1898 and subsequently realigned and widened from 2 ft. to 3 ft. 6 in. Ocean vessels can navigate the Congo River for 95 miles from its mouth to Matadi, but thence to Leopoldville numerous rapids make it unnavigable. The railway, which runs some distance to the south of the river, circumvents this obstacle to traffic.

Ultimately the Matadi-Leopoldville Railway may be linked with the Bas-Congo-Katanga and thus the whole railway system of Southern Africa, by the bridging of the 515-mile

gap between Leopoldville and Port Francqui, the present northern terminus of the Bas-Congo-Katanga; this section is being surveyed. Import, export and local traffic on the Matadi-Leopoldville line have increased considerably since the war, particularly between 1950 and 1952; for example, exports through Matadi rose from 488,341 *tonnes* in 1950 to 547,053 *tonnes*, and local traffic from 543,085 to 810,580 *tonnes* in the same period. The main export commodities hauled are palm oil and copper, of which 133,905 and 108,576 *tonnes* were carried down to Matadi last year. The total of African passengers conveyed has also increased considerably; the comparable figures are 459,465 and 635,628. The receipts in 1952 were fr. 638,198,849 and 447,792,213.

To cater for this increased traffic, the motive power and rolling stock has been augmented. Last year there were eight 90-ton diesel and 33 steam main line locomotives, 14 diesel and 35 steam shunters, 46 coaches and 2,870 wagons. Orders included 16 more main line and eight more shunting diesels, and 1,000 closed and open wagons.

The other two railways controlled by Otraco are less important. The Mayumbe is a 2-ft. gauge line running 87 miles inland from Boma, a port on the northern bank of the Congo between Matadi and its mouth. It has eight diesel and 23 steam locomotives, ten coaches and 324 wagons. Expenditure in 1952 was fr. 52,260,582 and receipts fr. 50,368,869. The Kivu system provides rail, road and water transport in the eastern part of the country, between Lakes Kivu and Tanganyika, and is of local interest only. The railway, of 3-ft. 6-in. gauge, runs from Kalundu, at the northern end of Lake Tanganyika, to Kamaniola, whence goods are conveyed by road to Bukavu, on Lake Kivu. European passengers and luggage are carried by road throughout, but a passenger coach is provided for the use of Africans travelling by rail.

Eastern Bengal Railway since Partition

PARTITION in 1947 and the subsequent boundary award left the territory in the east forming part of the new Dominion of Pakistan, the province of East Bengal (part of the former Bengal Presidency, with one district of Assam) with 1,600 miles of railway to serve a community of 50 million and an area of 50,000 square miles. The railway comprised broad and metre gauge lines with a small narrow-gauge (2-ft. 6-in.) mileage, of the former Bengal Assam Railway, itself formed during the war from the Eastern Bengal (broad and metre) and the Assam Bengal (metre gauge) Railways; it resumed the title of Eastern Bengal Railway. The transport situation was complicated by the division of Eastern Bengal by the River Brahmaputra which, because of its size and constantly changing course, is not bridged at any point, necessitating wagon ferries and passenger steamer services operated by the E.B.R. at two points. Before Partition much traffic from and to Eastern Bengal was routed through Calcutta as well as through the port of Chittagong. The latter is on the metre gauge. Partition strained the limited resources of Chittagong, which suffered *inter alia* from inability of inland water craft to make the necessary 100-mile sea journey from the Ganges/Brahmaputra delta during eight months in the year. The new frontier also isolated certain parts of Eastern Bengal, with the necessity for rail transit through the territory of the Republic *en route* from one Pakistan station to another. In addition, the B.A.R. was intensively usely in 1942-45 as part of the lines of communication in the war with Japan, and the E.B.R. inherited a plant suffering from insufficient maintenance, and depleted rolling stock and stores.

During the six years since Partition the main effort has been directed to adjusting railway facilities to the new economic situation. The capacity of the port of Chittagong was increased to meet immediate requirements by repair and extension of existing jetties and provision of additional sidings and various port installations. One difficulty has been movement of stone to Chittagong over a distance of at least 250 miles, and of cement, steel, tools, from Western Pakistan or abroad. The work of permanent expansion also is proceeding. The development scheme includes new berths, warehouses, and a new marshalling yard; all the railway work is being carried out by the E.B.R. The port last year dealt with over 1,700,000 tons, or three times the amount at Partition. To provide additional port facilities in Pakistan territory, the anchorage has been developed at Chalna, in the Sunderbunds. It is intended to serve the northern and western districts of East Bengal. In 1952-53 the tonnage handled was 420,000 against 350,000 the previous year. The opening of this port has accelerated industrial development at Khulna.

Increased traffic, largely with Chittagong, necessitated the doubling of the Bhairab Bazar to Akhaura, 20 miles, completed over three years ago. To avoid the transit through India between East Pakistan stations, a 43-mile cut-off line was opened to traffic in 1941 between Jessore and Darsana, which also has opened up the country it traverses. Among new branches is the metre-gauge line from Sylhet to Chhattak, expected to be opened at the end of this year; this will develop a densely populated region and facilitate movement of cement, limestone, and boulders from Chattak. Increased terminal facilities have been provided at Chittagong, Dacca, Narayanganj, and elsewhere, besides the major works in progress at the first-named. Rehabilitation of metre-gauge track during the past twelve months has been effected partly with steel sleepers from France, besides wooden sleepers from local forests. Conversion of the broad-gauge section to metre-gauge has been under consideration, with the object of economies in rolling stock maintenance, and so on, resulting from unified gauge. At present, however, a considerable amount of goods and passenger traffic passes over the broad gauge to and from Calcutta and the Indian broad-gauge system. There are several junction points with the metre-gauge North Eastern Railway of India; but the opening of the metre-gauge Assam Link has enabled railway traffic between the State of Assam and the rest of the Republic to avoid Pakistan territory.

The change in the trend of traffic after Partition accentuated the shortage of metre-gauge locomotives and rolling stock. This has largely been made good. Deliveries during the past year have included 25 oil-burning "YD" class locomotives from Japan. Forty general-purpose diesel-electric locomotives are being built in U.S.A. by the General Motors Corporation, of which ten are due for delivery shortly. Coaching stock recently placed in service includes all-welded steel coaches from Japan built to E.B.R. specifications, and lightweight steel coaches of semi-tubular construction are being delivered by French builders; a feature of this stock is the high proportion of electric fans, eight for each lower class carriage. Amongst the goods stock placed in service since 1947 is a large quantity of oil tank wagons and wagons designed for jute traffic. Oil burning has been adopted to some extent, though how far it is to be adopted as a policy depends on coal supplies from West Bengal and Bihar, in India. Besides new oil-burning locomotives, a number of coal-burners have been converted, with satisfactory results. The arrival of new motive power has enabled the average speed of goods trains to be raised and the average load to be increased. Acceleration of both freight and passenger services is expected to result from the placing in service of diesel-electric locomotives.

The passenger and goods yard at Akhaura has been equipped with power signalling; this is the third large E.B.R. station to be provided with modern signalling. Besides this, interlocking and multi-aspect signalling have been installed at a number of other stations. As elsewhere in Pakistan and in India, the comfort of the lower-class passenger has been studied in such matters as provision of improved waiting accommodation and drinking water at stations, besides improvements in rolling stock. Staff welfare measures include over 16,000 quarters built since Partition and a large school for railwaymen's children at Ishurdi, whilst a T.B. sanatorium for railway staff is being built near Chittagong.

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of correspondents)

Higher Fares in France

August 6

SIR,—In your editorial note of July 31 Mr. G. Hafter says that fares are higher in France and Switzerland than in Britain. From personal experience and observation I would say that currencies in both these countries are overvalued. The French franc at a farthing and the Swiss franc at 1s. 8d. are fantastic. The French franc should be valued at half-a-farthing and the Swiss franc at a shilling.

Yours faithfully,

JOHN PECKETT

Ariel, The Crescent,
Worlebury, Weston-super-Mare

The Harrow Accident

July 29

SIR,—The following paragraph from Mr. E. R. B. Roberts' letter on the Harrow accident, in your issue July 17 caught my eye: "The obvious explanation is that the engine brake had failed."

Has our reader ever heard of a brake failing on a passenger train? He admits that three applications had been made. If the vacuum brake is applied what alternative has it but to go on?

Yours faithfully,

H. SCOTT

1, Wharfedale View, Leeds, 7

August 7

SIR,—Regarding Mr. P. S. Lynch's letter in your issue of July 31, may I point out that the inquiry would have taken place whether the suggestion was put forward or not. The question of brake failure would have been investigated as a matter of routine. All the evidence seems to be against it, none for it.

Mr. Lynch is perfectly correct about the distant signal. When "clear," it shows that all the other signals in the section also are "off"; when at caution it requires a driver to be prepared to stop at the next signal or any of the others.

Mr. Roberts' statement, that the cautionary yellow leads drivers to keep running at speed until it is too late to pull up, is contrary to fact. If it is to take an outer home and a mile of braking to stop at the inner home, Mr. Roberts should tell us how he proposes to stop at the outer home, taking into account the varying visibility due to weather conditions in this country.

Yours faithfully,

COURTENAY BARRY

The Old Manor, Salisbury

Holiday Passenger Services

August 7

SIR,—The seasonal holiday specials between Lancashire and Yorkshire industrial areas and the North Wales coast load on the outward journeys at a number of successive stations and the chances of a passenger obtaining a seat at one of the last of these is remote. There may be two trains within half-an-hour, and an attempt has been made at the booking offices to divide the passengers fairly equally between them. In practice, however, most passengers seem to board the leading train and the second one runs lightly loaded. Waiting passengers down the line do not realise the second train is as empty as the leading one is overcrowded and try to force a way in.

Return journeys are even worse, for passengers from Rhyl and Prestatyn try to find seats in trains arriving already full from Llandudno and Colwyn Bay. It is no advertisement for the railways to see mothers with babies travelling in guards' vans. Trains should be filled with people who travel by rail because they willingly pay the higher fare, and not because they found motorcoach seats booked up and had to go by rail.

I have seen Liverpool-Leeds expresses this summer with many standing passengers in corridors who have hesitated to ask seated passengers to raise seat arms. When trains are running full, cannot station announcers ask passengers to raise arm rests?

Yours faithfully,

WILLIAM B. STOCKS

22, Heatherfield Road, Marsh, Huddersfield

Electric Locomotive Design

August 5

SIR,—Experience in Germany and Switzerland, and recent trends of thought in France, amply support Mr. H. Charnley's belief, stated in your issue of July 31, that suitably designed Bo-Bo locomotives should be able to handle all traffic in most countries.

A 4,000-h.p., 80-ton machine would be of value in the Pennines, and the real reason why none has been designed, I suspect, is that a 1,000-h.p. axle-hung motor is too awful to contemplate. Was not the decision to use Co-Co locomotives for fast passenger services between Sheffield and Manchester taken when it was found that the riding qualities of the Bo-Bo engines were very rough at speeds of over 60 m.p.h.? Again, axle-hung motors and very conventional bogies! The comparison with the Swiss (B.L.S.) "Ae4/4" of similar weight, or the "Re4/4" of similar power, cannot be ignored, and data obtained from these machines, with much lower adhesion factors than the British locomotives, would be of interest.

Perhaps British Railways, pending the design of a suitable flexible drive, might save time and gain valuable operating experience by following the French example and importing a pair of large Bo-Bos. There is a good precedent for such action, as the former G.W.R. was not ashamed to order its first gas-turbine locomotive from a Swiss source.

Yours faithfully,

JOHN RODGERS

132, Worrin Road, Shenfield, Essex

Availability of Season Tickets

July 25

SIR,—In his attempted justification of British Railways (your July 24 issue) Mr. M. B. Thomas omits to mention that before nationalisation L.N.E.R. season tickets to the City were available by many alternative routes, and, moreover, were available at alternative stations on the main line and branches without extra charge. Thus, New Barnet tickets were available at High Barnet, and vice versa.

In fact, if not in theory, one could travel from High Barnet to the City either *via* Highgate and Finsbury Park, or direct to Moorgate *via* Camden Town, after the advent of the tube. On the same ticket one could travel to and from New Barnet on the main line. From Finsbury Park the alternatives were: Broad Street direct; Moorgate by G.N. & City tube and thence to Liverpool Street by Circle line; to Kings Cross by steam, or tube *via* Arsenal, thence by Circle line to Liverpool Street; and by direct steam trains to Moorgate when running.

The withdrawal of the High Barnet/New Barnet alternative was bad enough, but it was even worse when the Eastern Region stopped running trains from Kings Cross to New Barnet between 6.59 p.m. and 9.21 p.m. To get home between those times one had to go to High Barnet by tube and pay full fare. Even now the Sunday morning service to New Barnet is but one train every two hours.

Yours faithfully,

R. G. LUCAS

120, Leicester Road, New Barnet, Herts.

THE SCRAP HEAP

Inverted Snobbery

Romance brought up the 9.15, but currently fashionable and inverted snobbery is more likely to assert that the job was done by an engine driver burdened with some such title as "mobile engineer." . . . Satisfaction comes to a man from mastering his craft and delighting in it and not from being buoyed up by verbal inflation.—*From "The Times."*

Fifty-Year-Old Saloon Renovated

The New South Wales Government Railways saloon built in 1901 for King George V, then Prince of Wales, who travelled in it on his visit to open the first Australian Federal Parliament, is being renovated for the use of H.M. The Queen on her forthcoming tour. It is stated by Mr. R. Winsor, Commissioner of Railways, New South Wales, to be in good condition, running smoothly, and a fine example of Australian woodwork and craftsmanship.

The vehicle was used later by the Duke of Windsor on his tour as Prince of Wales, and by King George VI and Queen Elizabeth, then Duke and Duchess of York, when they attended the opening of Parliament in Canberra in 1927, also by Governors General of Australia.

Mixed-Gauge Turntables

The photograph reproduced below of a mixed-gauge turntable at Strabane, Co. Tyrone, was sent us by a correspondent. It is believed to be the only such turntable now in use in Ireland serving both the 5-ft. 3-in. lines of the G.N.R.(I.) and the 3 ft. of the County Donegal Joint Committee.

Mixed-gauge turntables are to be found in various countries overseas. An example in South Australia, at Naracoorte, 5-ft. 3-in. and 3-ft. 6-in. gauges, was illustrated in our August 7 issue.

Bang Goes Sixpence

As the half-yearly interest on his railway shares, a dentist of Belper, Derbyshire, has received a cheque for 6d. It cost 2½d. to send the money and 2d for the cheque and 2d. is deducted for income tax.—*From "The Manchester Guardian."*

Safety in Speed Limits

Serious accidents on British railways are rare, but the most careful safeguards cannot give an absolute guarantee of safety. On Saturday, eight coaches of the famous "Royal Scot" swung off the track. It was fortunate that no lives were lost, but the disaster might well have been grim indeed. If railway accidents are not more frequent and more deadly the reason is to be found in a rigorous control of speed and right of way. Too often in post-war years, British trains have run behind their timing schedule, but it is better to travel safely than not to arrive.—*From "The Daily Telegraph" of August* 10.

End of a Railway

The Londonderry & Lough Swilly Railway is breathing its last. A few days ago it attained the dignity of a centenarian, but its condition was so weak that the birthday passed without celebration.

Thus another Irish narrow-gauge railway joins what has become the great majority. The Londonderry & Lough Swilly started life as a broad-gauge line, and it was not until the closing years of last century that it was converted to the 3-ft. gauge which had become the standard narrow gauge throughout Ireland.

One line has followed another into oblivion, until now there is not a single narrow-gauge railway left in Northern Ireland.

Perhaps I should make one exception to this—the narrow-gauge County Donegal Railway which, because its terminus is at Strabane, has a tiny portion of its track in Co. Tyrone.

The Londonderry & Lough Swilly Company seems to have decided early on that the future lay on the roads, whereas the County Donegal Railway has vigorously and apparently very successfully countered the threat of road competition by pioneering the extensive use of diesel railcars.

Our transport experts in Northern Ireland would probably give a good deal to know which chose the wiser policy.—*Eric Montgomery in the "Belfast News-Letter."*

[The Londonderry & Lough Swilly Railway was closed on August 10.—ED., *R.G.*]

On Their Honour

This morning, as the train drooled into Paddington, I saw on a wall near the tunnel mouth "School. Engines please make as little noise as possible." Unique exhortation. The engines smirking like schoolgirls put on their honour not to talk, glide past, letting off wild shrieks when not quite out of earshot. —*Philip Hope-Wallace in "The New Statesman & Nation."*

To Be or Not To Be

The title came from William S.,
But seems to cover the awful mess
That R.E. staff all face today:
They do their work, but with dismay.

Where do they go from 222—
Or don't they go, but stay to do
Some work for those who now contrive
To build a scheme from 55?

The rumours heard are nearly legion.
Some will go back to parent Region,
Where welcome may be very frigid
For "acting" posts have struck them rigid.

Some who are more early dated,
T'is said, will soon be relegated
To Super Fund before their time
On compensation—sounds sublime.

For goodness' sake will someone please
Put the officers at their ease?
When are they to know their fate?
Come, tell them now before too late.
Rumour was always a fickle jade;
They are not of the truth afraid.

WONDERING

E 2

Photo.] [*J. C. Gillham*

Mixed-gauge turntable at Strabane, Northern Ireland, serving the G.N.R.(I.) (*5-ft. 3-in.*) *and County Donegal Joint* (*3-ft. gauge*) *lines*

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

Condensing Locomotive Tested

The report in our July 31 issue on the testing at Salt River Workshops of the first condensing locomotive should have referred to this as a class " 25 " locomotive. The suffix " NC " denotes the non-condensing locomotives which are to be built of this class.

Railway Finances

In the financial year which closed on March 31, 1953, the railway administration showed a loss of £4,750,000. This deficit can be covered by the rates equalisation fund, but would deplete it, leaving only a balance of some £2,000,000 to meet future contingencies.

In presenting his budget for 1953-54, the Minister of Finance pointed out that the Central Government has decided to meet part of its capital requirements from current income and that it was desirable that other public services such as the railways, the provincial administrations, city councils and the Electricity Supply Commission, should adopt a similar policy. This, on the railways, would necessitate higher tariffs, unless the public was satisfied to have the extension of services curtailed.

Another factor which made an increase in tariffs necessary was the substantial amount required for capital expenditure. This year the railways will receive £36,000,000 new capital for improvements and extensions of services. The interest on capital must be met from current income, and the capital to be allocated this year would mean that its annual interest repayment would be increased by £2,000,000. In addition it may be necessary to find a further sum for increased cost of living allowances to railway servants.

VICTORIA

Melbourne Suburban Stock

The new Melbourne suburban electric stock, totalling 30 seven-car trains, for which orders have been placed, will be generally similar inside to the experimental suburban car at present in service and illustrated in our December 1, 1950, issue. A train will seat 465 passengers, and have a crush loading capacity of 1,323.

Dimensions are: Length over body, 60 ft. 9 in.; bogie centres, 43 ft.; height to top of roof, 12 ft. 4 in.; and width over body, 9 ft. 9 in. Seating and crush load capacity is 59 and 181 for motorcars, and 72 and 195 for trailer cars.

Delivery of the new equipment will permit existing trains composed of swing-door compartment cars (originally converted from steam stock), many of which are 60 years old, to be withdrawn from service.

As recorded in our May 29 and June 26 issues, the 90 motorcoaches are to be built by Gloucester Railway Carriage & Wagon Co. Ltd., the 120 trailers by Martin & King Pty. Ltd. (Victoria), and the 180 bogies for 90 motorcoaches and 240 bogies for trailers manufactured by Bradford Kendall Limited (New South Wales).

CANADA

C.P.R. Gross Earnings

Gross earnings of the Canadian Pacific Railway increased both in June and for the first six months of this year, but were more than offset by operating expenses.

In June, gross earnings increased by $1,510,055 to $40,729,889. Operating expenses rose by $1,829,011 to $38,454,059, leaving net earnings $2,275,830, a decline of $318,956 compared with June, 1952.

For the half-year gross earnings rose by $9,359,214 to $231,485,525, but operating expenses increased by $9,989,963 to $220,978,173. Net earnings were thus $10,507,352, a decrease of $630,749 compared with the 1952 period.

New Reservation System

A system of railway reservations by telephone has been put into operation by the Canadian Pacific Railway passenger department. The new service is available at Montreal Windsor Station travel bureau and the city ticket office in St. James Street.

Intending passengers telephone the reservation agent, giving the information required to make up the itinerary and obtain the proper accommodation, and at a convenient time call at the ticket office, where the tickets are ready.

UNITED STATES

Transport to Scout Jamboree

One of the largest mass movements of passengers over U.S.A. railways since the war ended took place in connection with the Third National Jamboree of the Boy Scouts of America, held at Santa Ana, California (36 miles south of Los Angeles on the Santa Fe main line to San Diego) on July 17-23. The camp accommodated over 50,000 boys from all the States of the Union, and from Alaska, Hawaii and other more distant places and 38,000 of these were transported to and from Santa Ana by rail.

This movement required the services of 1,200 coaches or sleeping cars, 43 troop kitchen cars borrowed from the U.S. Army, 175 baggage cars with camping equipment, 90 box-wagon loads of food, and ten wagons of coke for cooking. Over 30 special trains ran the entire width of the Continent between the Eastern States and California. Most of the specials were routed to enable the boys to see places of interest such as the Grand Canyon and Yellowstone Park. Uniform menus in restaurant cars made possible flat charges of $1 for breakfast, $1·45 for lunch, and $1·75 for dinner, all much below normal charges. Planning began a year before the movement took place.

A Gauge Conversion in Colorado

Part of the extensive former narrow gauge system of the Denver & Rio Grande Western Railroad has been saved from abandonment by conversion to standard gauge. This is the 26 miles from Montrose to Ridgway, the southern end of a branch which once extended for 132 miles south from Grand Junction, on the Denver-Salt Lake City main line.

The 73-mile section from Grand Junction to Montrose already was converted to standard gauge; the 26-mile conversion from there to Ridgway was completed by two 45-men gangs in seven working days. Preparations had been going on for some time past, however, by the widening of embankments and the laying in of standard gauge instead of narrow gauge sleepers when repair work was in progress. Despite various abandonments, the D. & R.G.W. still owns a considerable length of narrow gauge mileage.

CUBA

United of Havana Developments

After its meeting on August 4 to consider the decree for a bond issue for acquisition of the British-owned United Havana Railways the advisory council sent the loan bill to the finance committee for consideration. While it has not been specifically stated, it is understood that the bonds are to be internal Cuban peso bonds.

The commission which will organise the new company, to be known as Occidental Railways of Cuba, was constituted on August 5. This company is to take over the United Railways once this concern has been bought or expropriated by the Government. The commission is expected to begin work immediately studying the reorganisation of the United Railways and the constitution of the Occidental company.

FRANCE

Cars Through Mont Cenis Tunnel

According to *Le Monde*, it is intended to improve the transport of motorcars by rail through the Mont Cenis Tunnel. The loading and unload-

ing of cars on wagons and the customs formalities take a long time and the cost of transport from Modane to Bardonnechia is comparatively high, nearly fr. 4,000 excluding the price of the passenger ticket. As there are only five trains a day, there are long periods of waiting at the entrance to the tunnel.

It is proposed that the S.N.C.F. in agreement with the Italian railways should issue a combined ticket for the transport of the car and passengers at a low rate. A shuttle service for quicker transit could be performed by a special locomotive and a few wagons. As a system of semi-automatic signalling has recently been installed, a train could be run through the tunnel every eight minutes.

Later, sidings and specially-equipped wagons would be provided for the service. Vehicles fitted with three-phase asynchronous motors could carry one to three motorcars. No driver would be needed, as starting, limiting speed, and stopping would be automatic. The entire equipment for the Mont Cenis Tunnel would cost between fr. 600 and 700 million, France and Italy sharing the expenditure. Experts consider that this would be sufficient for any number of cars, whatever the growth of the traffic. Thus the heavy expenditure, estimated at fr. 20,000 million for a road tunnel under Mont Blanc could be deferred to a more favourable time.

Perishables Traffic Regulations

An order has been issued by the Government fixing transport conditions for certain types of perishable goods whether moving by rail or road. In particular it has been laid down that, with effect from November 1, 1953, where fresh foodstuffs are to be conveyed for distances greater than 150 km. (93 miles), transport shall take place in refrigerated or insulated vehicles, the recommended temperature inside the vehicle being not more than 50° Fahrenheit.

The S.N.C.F. is better able to carry out the terms of this order than are the road haulage undertakings, who will find a particular difficulty in the movement of small consignments not originating from cold stores.

Track Lowering at Valence

In preparation for ultimate electrification between Lyons and Marseilles, the double-track line in Cagnard Tunnel near Valence had to be lowered on an average by 2 ft. 3 in. This tunnel is 765 yd. long and the work involved the removal of 7,848 cu. yd. of ballast. In addition, one line of track had to be renewed with welded rail, a main conduit had to be demolished, 22 recesses for the shelter of permanent way staff had to be reconstructed and cable for colour-light block signals had to be installed. A temporary single line was constructed and the work began on February 25. Excavation was undertaken by a modified type of Drouard track machine, specially designed for working in a confined space. Loading of ballast took place during a four-hour period each day, the ballast train standing on the track on which work was not taking place. The tunnel was opened to normal traffic again by March 26.

Freight Rate Increase

On May 15 freight rates were increased by amounts according to the nature of the traffic. The rates on small parcels weighing from 4 to 50 kg. (9 lb. to 110 lb.) went up by from 10 to 25 per cent and express parcels by approximately 25 per cent; the increases in rates on wagon-load traffic varied according to the tonnage in the wagon. Rates on loads of 1½ *tonnes* and 2 *tonnes* were raised by 25·23 per cent; those on 3- and 5-*tonne* loads by 13·31 per cent; those on 7- and 8-*tonne* loads by 7·78 per cent; and rates on 10-*tonne* and 12-*tonne* loads by 2·53 per cent. There was no increase in rates on larger wagon loads. Increases in the rates on livestock ranged up to 19·12 per cent.

WESTERN GERMANY

Basle-Karlsruhe Electrification

The electrification of the 121-mile Basle-Karlsruhe main line of the German Federal Railway, the preparatory work of which is already in hand, is to cost D.M. 200 million. As reported in our issue of February 6, Switzerland is to contribute D.M. 140 million; a further D.M. 30 million is to be provided half by Switzerland and half by Western Germany. The motive power for the electrified Basle-Karlsruhe line is to consist of 60 electric locomotives and 16 three-coach railcar sets. It is anticipated that passenger train journey times on the electrified line will be reduced by an average of 20 per cent and those of goods trains by 30 per cent.

BELGIUM

Helicopter Service from Allée Verte

On August 1 the Allée Verte Station, the original station in Brussels, opened in 1835, became the terminus of a helicopter service to Rotterdam. Later in the week services began to Liége and Maastricht and it is intended to give a connection with Cologne and Bonn.

DENMARK

Great Belt Crossing

The State Railways have published plans for a new Great Belt crossing to supplement to the present ferry between Korsor and Nyborg. Since the war the traffic across the Belt has much increased. New railway ferries and motorcar ferries have been put into service, and new ferry berths are being built at both Nyborg and Korsor. The new Gedser-Grossenbrode ferry, which now carries the Scandinavia-Italy express, has drawn off some traffic, but with the rapidly increasing number of motorcars carried over the Belt it is thought that in a few years the harbours at Nyborg and Korsor, where it is difficult to build new ferry berths, will be overburdened.

It is proposed to give another ferry service across the Belt on its narrowest point; the present ferry harbours are at the end of fjords. The sailing distance will be reduced from 26 to 19 km., making it possible for a ferry to make six round trips a day instead of five at present. The new route would be used exclusively for motorcars and passengers, and railway traffic would still use the present route.

The new ferry ports, at Knudshoved and Halskov, would have each two ferry berths, costing about kr.35,000,000, and a new motorcar ferry would cost between kr.13,000,000 and 15,000,000. Road approaches would cost another kr.20,000,000. The new motorcar ferry would hold cars on the deck and on an upper floor above the deck reached by ramps on both sides of the ship. About 120 cars could be carried.

SWEDEN

Air-Conditioned Dining Cars

The State Railways are to introduce on express trains a new type of dining car, with all-welded frame. The cars, which will seat 48, will replace wooden 32-seat vehicles. They will have air-conditioning, for which two plants will be provided, each consisting of the cooling equipment under the floor, the conditioning equipment with filter, fans and batteries between roof and ceiling, and two air intakes on the roof.

All the motors will be of the squirrel-cage type, for 380 volt, three-phase a.c., 50 cycles, fed from a current transformer under the floor. Each air-conditioning plant will have a capacity of nearly 3,000 cu. yd. an hour with a minimum fresh air percentage of 25 per cent.

The all-electric kitchen equipment will have a power requirement of 50 kW. A failure of the supply from the electric locomotive will be indicated by special pilot lights. The car will carry some 400 gal. of water in two large tanks under the floor, from which the water will be pumped up automatically. The tare weight will be 51 tons and the service weight 59 tons.

U.S.S.R.

Increased Performance Reported

The average turnround of freight vehicles is stated to have been reduced in the first half of 1953 by 3 per cent compared with the corresponding period of 1952.

The average daily loadings of all traffics increased in the first half of 1953 over the previous year by 6 per cent, including the loading of coal by 4 per cent, coke 12 per cent, oil and oil products by 10 per cent and ore by 12 per cent.

European Passenger Train Services, 1913-53

Accelerations through electrification and introduction of diesel traction

(By a Correspondent)

THE progress made in the 40 years since 1913 in reducing train journey times between population centres in some European countries is shown in the table below. The journey times shown are the fastest in the summer timetables of the three years. Although, as in Britain, and more particularly in France, summer timetables tend to include many fast seasonal services, the omission of certain winter-only trains detracts from the 1913 performance, as 1912-13 and 1913-14 winter services are not shown which gave considerably faster timings between Paris and Marseilles ("Côte d'Azur Rapide") and between Rome and Genoa ("Rome Express") and so on. Many of the trains shown, especially in 1913, were or are restricted to certain classes of traveller, and certain of them, such as the "Talgo" and "T.A.F." trains in Spain, and the Oslo-Bergen diesel trains run in connection with the Bergen Line sailings to Newcastle, run on certain days only of the week. These details have not been shown, so as to keep the table clear of notes.

The choice of provincial destination has depended on various factors. In Austria, Feldkirch is the most distant station from Vienna on the Arlberg main line short of the Swiss frontier, and similar considerations apply to Arlon in Belgium, near the Luxemburg, and to San Sebastian in Spain, near the French frontier, so as to illustrate the service over important main lines. In France it was not possible to show Strasbourg, which was in German territory in 1913, or Paris-Basle timings, as trains in 1913 were routed beyond Belfort *via* Delle. The inter-Zonal boundary in 1953 vitiates any comparison between journey times to and from Berlin; Cologne has been chosen as a metropolis partly as being near Bonn, the capital of the German Federal Republic. Mileages are not shown, as different routes were followed in some cases.

Varying Routes

The steam timing in 1913 of 55 min. between Amsterdam Weesperpoort and Rotterdam Maas *via* Gouda was over a much shorter distance than the present electrified main line between Amsterdam Central and Rotterdam D.P. *via* The Hague. The best Paris-Nantes timing of 1913 was by the Paris-Orleans Railway *via* Tours and Saumur; the present express route is that *via* Le Mans of the former State Railways, which incidentally ran one train taking 6 hr. In Germany, different routes have been followed at different times in the Ruhr (between Cologne and Münster, on the way to Hamburg), and along the Rhine, with Cologne to Basle and to Munich, whilst Cologne-Munich trains have at times followed different routes beyond Mainz or Wiesbaden, *via* Stuttgart or Würzburg. Swiss Federal trains follow different routes between Olten and Lausanne. The opening between the wars of the "Direttissima" line between Rome and Naples reduced the distance between Rome and Palermo.

Before 1939, certain cut-off lines were brought into use between Brussels and Ostend. The Madrid to Valencia "T.A.F." runs direct *via* Cuenca. In Denmark, the opening of the Little Belt bridge, eliminating one train-ferry, has much reduced journey times.

Another factor affecting mileage is the use of terminal stations. In Paris, trains to and from Bordeaux, Toulouse, and beyond now use the Austerlitz station, some distance short of the Quai d'Orsay terminus, which no longer is used by expresses. The situation in Brussels is complicated by the recent opening of the Junction line. The timing of the train shown to Arlon this summer is from Brussels Nord, and of that to Ostend from Brussels Midi. Because of the smoke in the long tunnel adjoining Lisbon Rossio terminus, the Lisbon-Oporto diesel trains use the Santa Apolonia station.

Motive Power

Despite the new works mentioned, the greatest factor in acceleration over the past 40 years has been electrification and introduction of diesel traction, the latter mainly in the form of train sets of varying formation. The main exception is the Spanish "Talgo" train, which is hauled by a diesel locomotive even over the electrified portions of the Madrid - San Sebastian - Irun/Hendaye main line. Even in diesel or electric multiple-unit sets seating capacity probably is no less than in 1913, when the fastest steam trains were light.

War damage seems to have little effect. The 1939 timings—if the timetable is correct—in Spain are remarkable in view of conditions in that country at that time.

TABLE

D : diesel traction. E : electrified throughout. PE : electrified part of the journey

Country	From	To	1913	1939	1953	Remarks
			hr. min.	hr. min.	hr. min.	
Austria	Vienna	Feldkirch	14 51	PE 11 6	E 11 23	1913 : via Selzthal ; 1939 : electrified Salzburg to Feldkirch
Belgium	Brussels	Arlon	3 29	2 49	2 41	—
,,	,,	Ostend	1 38	1 12	1 22	
Denmark	Copenhagen	Aarhus	8 16	D 4 30	D 4 39	1939 and 1953 : "Lyntog"
,,	,,	Esbjerg	7 44	D 4 25	D 4 59	1939 and 1953 : "Lyntog"
France	Paris	Belfort	5 26	4 50	4 31	1953 : pneumatic-tyre train (steam hauled)
,,	,,	Bordeaux	6 5	E 5 39	E 5 10	1953 : non-stop (363 miles)
,,	,,	Lille	2 54	D 2 30	D 2 27	—
,,	,,	Marseilles	11 40	9 5	PE 8 7	1953 : electrified Paris to Lyons
,,	,,	Nantes	5 39	PE 4 18	PE 4 10	1939 and 1953 : electrified Paris to Le Mans 1913 : via Tours
,,	,,	Toulouse	10 56	E 8 56	E 8 40	—
Germany	Cologne	Basle	8 6	5 50	D 5 52	Varying routes
,,	,,	Hamburg	6 57	D 4 33	D 5 34	—
,,	,,	Munich	10 52	8 12	D 7 35	Varying routes
Italy	Rome	Genoa	9 45	E 5 11	E 6 29	—
,,	,,	Milan	12 10	E 6 0	E 6 35	1953 : luxury "elettrotreno"
,,	,,	Palermo	22 10	PE 15 42	PE 16 50	1939 and 1953 : electrified Rome to Straits of Messina ferry 1953 : short section electrified in Sicily
,,	,,	Venice	11 28	PE 7 15	PE 6 49	1939 and 1953 : electrified Rome to Bologna
Netherlands	Amsterdam	Maastricht	4 16	D 3 17	E 2 46	—
,,	,,	Rotterdam	0 55	E 1 9	E 1 5	1913 : via Gouda ; 1939 and 1953 : via The Hague
Norway	Oslo	Bergen	12 8	10 30	D 7 40	
Portugal	Lisbon	Oporto	5 35	5 7	D 4 18	—
Spain	Madrid	Barcelona	14 46	12 51	D 10 20	1953 : "T.A.F."
,,	,,	San Sebastian	13 22	PE 10 0	D 8 5	1953 : "Talgo," diesel-hauled over electrified sections
,,	,,	Seville	11 40	10 25	D 8 25	1953 : "T.A.F."
,,	,,	Valencia	10 33	9 45	D 6 30	1953 : "T.A.F."
Sweden	Stockholm	Gothenburg	8 21	E 6 5	E 4 52	1953 : high-speed electric multiple-unit set
,,	,,	Malmo	11 0	E 7 58	E 7 57	—
Switzerland	Zurich	Geneva	5 37	E 3 21	E 3 15	1939 and 1953 : lightweight stock
,,	,,	Lugano	4 59	E 3 38	E 3 14	1939 and 1953 : lightweight stock

New Swiss Standard-Gauge Mountain Branch

Electrically-worked adhesion line to serve hydro-electric plant in Rhone Valley

THE construction of important hydro-electric plant in the mountains south of the Rhône Valley, in the Swiss Canton of Valais, required the provision of adequate transport facilities, particularly for the transport of 600,000 tons of cement for the new dam at Mauvoisin. It was decided therefore to construct a single-track branch line from Sembrancher, on the Martigny-Orsières Railway, to Le Châble, further up the Dranse and closer to the site of the Mauvoisin Dam.

Railways in south-eastern Switzerland and adjacent parts of France

The construction of the branch was financed by contributions from electricity undertakings and local authorities to the extent of fr. 2,700,000; the remaining fr. 600,000 were subscribed by the Martigny-Orsières Railway Company.

Although the new line is intended chiefly for goods it is also being used for passenger traffic, to the benefit of the resorts of Verbier and Fionnay situated in the mountains above Le Châble. Apart from local services, through trains from Geneva and Lausanne *via* Martigny and Sembrancher to Le Châble, and possibly even week-end special trains from Paris for ski-ing weekends may be run.

Like the Martigny-Orsières line, the line from Sembrancher to Le Châble is a standard-gauge single track, electrified at 15,000 V., 16⅔ cycles. The line is four miles long and has a maximum gradient of 1 in 27; the sharpest curve is 525 ft.

Starting from Sembrancher Station, the line crosses to the right bank of the Dranse on a reinforced concrete viaduct 1,214 ft. long, consisting of a girder bridge carried by sixteen piers about 33 ft. high, and a single-span arch of 164 ft. span and a maximum height of 44 ft. On the other side of the valley, the line rises along the hillside to the village of Etier, where a halt is provided which also serves the village of Vollèges. The line then crosses the Merdenson torrent and reaches its highest point at Les Jorasses whence it falls gently past the village of Villette to the terminus at Le Châble. The platform has plant for transhipping cement and other building materials from the railway to the ropeway which connects the station with the working sites near the Mauvoisin Dam.

Bridges and Tunnels

Apart from the viaduct at Sembrancher, a road bridge over the railway at Etier, a reinforced concrete bridge across the Merdenson torrent and short tunnels through the embankment of the Vollèges-Bagnes road and through the abutment of a road bridge over the Dranse between Villette and Le Châble were required.

Rails and sleepers were acquired secondhand from the Swiss Federal Railways. The rails have been welded in lengths of 79 and 118 ft., except on a short section where because of a risk of rails being damaged by slips or falling stone, shorter lengths of 30 or 40 ft. have been preferred so that damaged rails may be more easily replaced. Metal sleepers have been laid throughout. The overhead contact line is of the oblique catenary type.

The summer timetable shows ten journeys a day, each way; the running time is 12 min. with one intermediate stop at Etier.

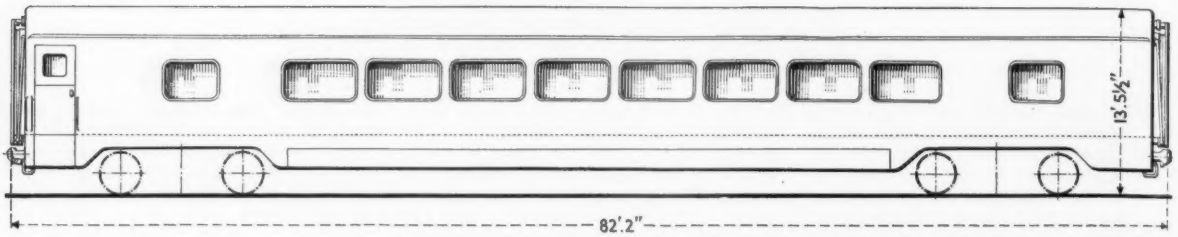
SCOTTISH REGION TOURS.—British Railways, Scottish Region, announce a special combined rail and road tour from Glasgow and Edinburgh, and certain stations en route, to Banchory, Bridge of Feugh and Crathes Castle on August 16 and 30, and Kemnay, Castle Fraser and Loch Skene on August 23. Passengers join motor-coaches at Aberdeen.

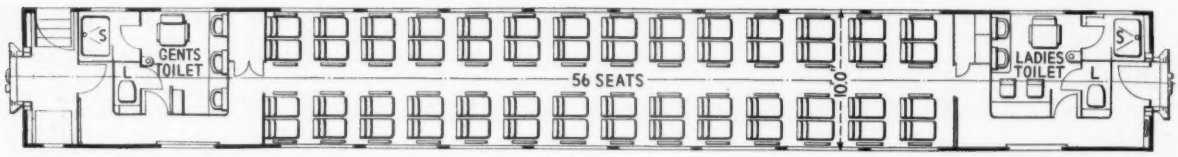
NIMOPLY 75 COMPOSITE METAL SHEETS.—For some years the high-strength, high-temperature alloy, developed under the name of Nimonic 75, has been widely used in sheet form for the combustion chamber linings in many British gas turbines. Henry Wiggin & Co. Ltd. now announces the introduction of composite metal sheets, known as Nimoply 75, having Nimonic 75 on both sides of a copper base. This metal sandwich is produced by rolling copper between sheets of Nimonic 75, resulting in a clad sheet having many potential uses, not only in gas turbine construction but also in other fields of high-temperature engineering. It is claimed that the material has the same characteristics of Nimonic 75, but has a much higher heat conductivity in order to dissipate heat more quickly.

B.S. FOR ENGINEERING LIMITS AND FITS.—The British Standards Institution has published B.S.1916, Part I, "Limits and Tolerances," in which for the first time there is offered a system of limits and tolerances sufficiently comprehensive to cover every need from the watchmaker at one end to the heavy industries at the other. Committees of the B.S.I. have been investigating for some years past the possibility of providing a comprehensive system of limits and fits which would both be acceptable to British industry and which would also offer a basis for a universal standard. B.S.1916, Part I, is the result of this work and it makes available in inch measure the same range of fits, covering almost all the needs of engineering, as the I.S.A. system has long given to the Continental countries. Tables of metric equivalents are also included for the benefit of those who have to work to metric measure, and the same method of designating fits is applicable to both systems of measurement. B.S.1916, Part 1, supersedes B.S.164, and it gives a choice of fits so wide that users would be able to make the transition from existing systems without undue difficulty. But to help users in applying the system to their own needs, and at the same time to encourage a greater degree of uniformity and interchangeability in the future, there is now in course of preparation Part 2 of B.S.1916 which will give guidance in the use of Part 1 and offer recommendations and examples of the selections of fits. Copies of B.S.1916, Part 1, are available from the British Standards Institution, Sales Branch, 24 Victoria Street, London, S.W.1, price 10s. each.

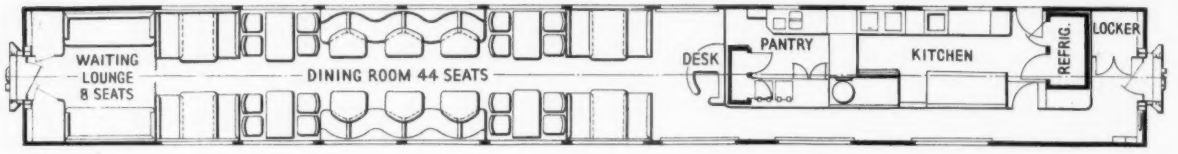
XUM

Diesel Trains for Mexico

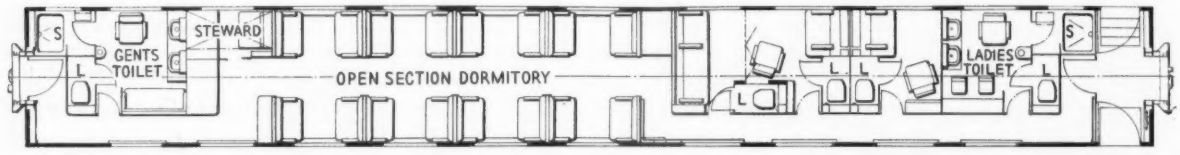




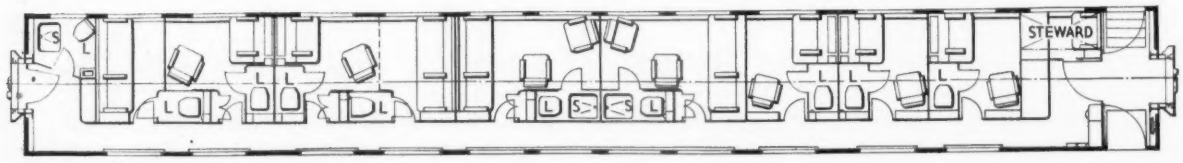
1ST CLASS DE LUXE COACH



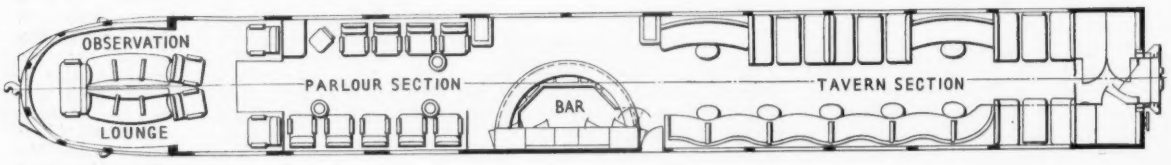
DINING CAR



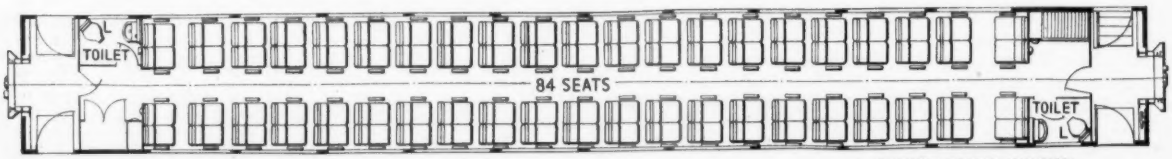
COMPARTMENT OPEN SECTION SLEEPING CAR



COMPARTMENT SLEEPING CAR



OBSERVATION CAR



1ST CLASS ORDINARY COACH

S SHOWER ACCOMMODATION
L LAVATORY

Elevation and plans of the rolling stock showing the various layouts

Diesel Trains for Mexico

Sleeping, restaurant, and observation cars and ordinary coaches in Swiss-built trains for 20-hour journeys

Restaurant car showing steward's serving table adjoining pantry

A TOTAL of 57 main-line coaches has been built to the order of the Mexican National Railways by Schindler Waggon A.G., of Pratteln, near Basle, in Switzerland. The order comprised 25 first class ordinary coaches which are to be used on various main line long-distance trains and 32 luxury coaches of six different types, five of which are shown in the accompanying diagram; they are to be made up into three special trains to run between Mexico City and the U.S.A. frontier at Laredo. This, a distance of 810 miles, is to be covered in about 20 hr. by the "Aztec Eagles," as these trains are to be known. At the moment, speed on this route is limited to 68 m.p.h., but this is likely to be raised. Actual top speed of 100 m.p.h. was considered in the design of the coaches.

Accommodation

Diesel haulage, with two 1,500 h.p. locomotive units is to be provided for these trains, which will normally consist of one baggage-postal van, two first class coaches each seating 84 passengers, two first class luxury coaches each seating 56 persons, one restaurant car with 44 seats and another eight seats in a small ante-room at the end remote from the kitchen. In addition, there will be two sleeping cars with 38 seats or 22 sleeping berths in open sections, a sleeping car with 20 beds arranged in small suites, and one observation car at the tail end with a total of 56 seats. The empty weight of such a train is about 450 tons.

Though built to the Schindler lightweight all-welded stressed-skin construction, all the stock had to be built to Association of American Railways requirements as to strength, in particular the centre sill and the ability to take an end buffing load of 800,000 lb., to be applied through the centre coupler without permanent deformation of the car frame. Tests were made on one of the 43-ton first class cars, in which the body length was 82 ft. 2 in., the bogie pivot pitch 59 ft. 6 in., the body width 10 ft., and the body structure weight 16 tons. First a uniformly distributed load of 32 tons was applied, this representing the weight of the equipment and seats in the body in its fully completed state *plus* 2½ times the normal pay load. Maximum deflection of the centre sill, at mid car length, was 0·168 in., and the inside height of the car body was increased by 0·171 in. Inside width at cantrail level decreased by 0·125 in. All these deflections were within the elastic limits, and disappeared when the load was removed.

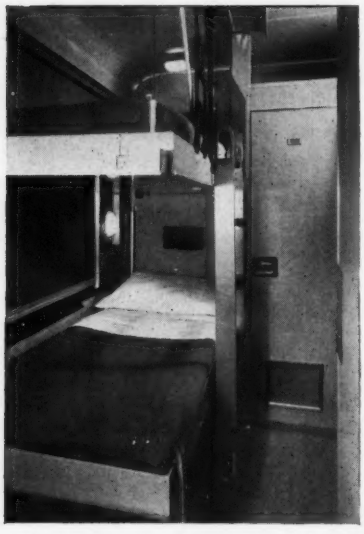
Load Tests

In the buffing load test the car structure was first loaded with 16 tons evenly distributed, this representing the weight of the car equipment. The buffing load of 800,000 lb. was then applied to the drawgear stops at one end in accordance with A.A.R. specification C-51-1939(6a), this being the most severe. Maximum deflection of the centre sill at mid car length was 0·307 in. Car body height decreased by 0·045 in. and width increased by 0·055 in. A deflection of 0·5 to 0·75 in. is mentioned as normal for steel construction in the A.A.R. specifications. The centre sill is made up of two U sections 11¾ in. deep connected by welded steel plate cross-members down the whole length. Apart from certain parts of the headstock, all other constituents of the whole body structure are made of pressed and bent sheets.

Bogies

Copper bearing steel, with 0·5 per cent of copper is used for these Mexican coaches. In general construction the

Parlour section and observation lounge in air-conditioned coach, Mexican National Railways



Double bedroom compartment in air-conditioned sleeping car

different varieties of coaches are similar, and length, width and bogie pitch of all are the same. The bogies are of the now familiar Swiss type without axlebox guides of the usual form. They have S.K.F. roller bearings, and the cylindrical axleboxes incorporate the Schindler form of adjustable hydraulic damper. Primary suspension is through helical axlebox springs surrounding the hydraulic damper and with a rubber ring between damper casing and axlebox. Secondary suspension is through bolsters carried on longitudinal laminated springs of comparatively great deflection per unit of load.

The Tightlock couplers and Miner drawgear, Westinghouse air brake hoses, air signal connections, and steam heating connections on the underframes are arranged to allow inter-coupling with U.S.A. coaches.

Fittings and Equipment

Interior fittings and equipment were to Mexican requirements, specified to be of the most modern and luxurious type, and with all windows of double safety glass, those of the restaurant car being polarised. The accompanying illustrations show details of various coaches. Full air conditioning is applied with equipment from the Safety Car Heating & Lighting Company, with a special Carrier compressor. The ordinary first class coaches for miscellaneous service do not have air conditioning. Current for air-conditioning and for car lighting is supplied by a 25-kW. Brown Boveri gear-driven dynamo in each vehicle. Fluorescent lighting is provided in all cars except the baggage-postal cars, and a half-power circuit is provided for night illumination. Kitchen equipment in the diner is of stainless steel, with the different items welded up. The restaurant and observation cars have no side entrance doors.

Air-conditioned first class coach with reversible seats

THE ENGINEERS' GUILD.—In its July issue the *Journal of the Engineers' Guild* reviews the progress made since the body was inaugurated on May 16, 1938. Among many other matters it recalls that the Guild has urged on the Minister of Transport that, as in the case of railways, serious road accidents ought to be the subject of inquiries by professional engineers experienced in highway and traffic matters. A substantial contribution to enhancing the prestige of the engineering profession in this country is recorded, and emphasis is placed on the importance of the Guild's activities in the professional fields outside the chartered limits of the engineering institutions, but in consultation with them when necessary.

TITANIUM PRODUCTION.—The Ministry of Materials announces that it has recently concluded a contract with Imperial Chemical Industries Limited under which the company will erect at its own expense capacity to produce 1,500 tons of sponge titanium a year. The company will also install capacity for converting this metal to ingot form, and it expects production to begin in two years' time. The Ministry has undertaken to buy directly up to three-quarters of the company's output of sponge titanium over the first four years of production if the metal is not otherwise sold in various forms for use by Government contractors, and the Ministry has an option on the full output if needed for defence purposes. The price of the metal will be equivalent to the world price current at the time of purchase.

HOLIDAY TRAFFIC ON BRITISH RAILWAYS.—Holiday traffic was again heavy on British Railways services on Saturday, August 8, and 251,651 passengers left the principal London termini in 570 long-distance trains. The clearance of deep-mined and opencast coal for the fortnight ended 6 a.m. on August 10 amounted to 3,523,720 tons. During the week ended August 1, 147,524 tons of iron and steel from the principal steelworks and 335,900 tons of iron ore were conveyed.

TESTING AND WEIGHING EQUIPMENT.—A feature of the exhibits displayed by Saml. Denison & Son Limited, at the Engineering & Marine Exhibition to be held at Olympia, London, September 3-17, will be the Denison T.42B, 50-ton universal testing machine. Of the vertical type and self-contained, the machine is manufactured in either 30- or 50-ton capacities. The load is applied hydraulically, and the load of the specimen is determined by means of a sensitive weighing lever system and a dial indicator. Both types have four sub-capacities, full, half, one-fifth, and one-tenth. Other exhibits will include a 6-7 ton Universal tester, 15,000 lb. self-indicating tensile tester, a Denison equilibrium-controlled taps and ticket indicator for use with weighbridges, and other testing equipment.

MATERIALS HANDLING IN THE U.S.A.—The Organisation for European Economic Co-operation has published a report on the visit to the U.S.A. of a group of representatives from Europe to study materials handling equipment and methods. The report reviews typical aspects of materials handling technique and describes the principal devices used, including conveyors for bulk products and packaged goods. There is also a full description of the various trucks used in industry, covering hand and electric types, trucks with fixed and lifting platforms, and fork trucks. In conclusion a number of examples of efficient handling organisation seen during the visit are described. Copies of the report are available from all O.E.E.C. sales agents, which include H.M. Stationery Office. The price is 9s.

Road-Rail Transport in France

Development of trailers to facilitate door-to-door delivery

IN our issue of December 23, 1949, we published an illustrated article describing the development of trailer equipment and the experiments being pursued by the French National Railways to improve door-to-door delivery services. The equipment related to bogie trailers, and two bogies being linked by a telescopic steering bar that can expand to allow the transport of wagons up to 26 ft. wheelbase, also an 80-ton load trailer with two twelve-wheel bogies for wagons up to 36 ft. wheelbase.

One-Piece Underframes

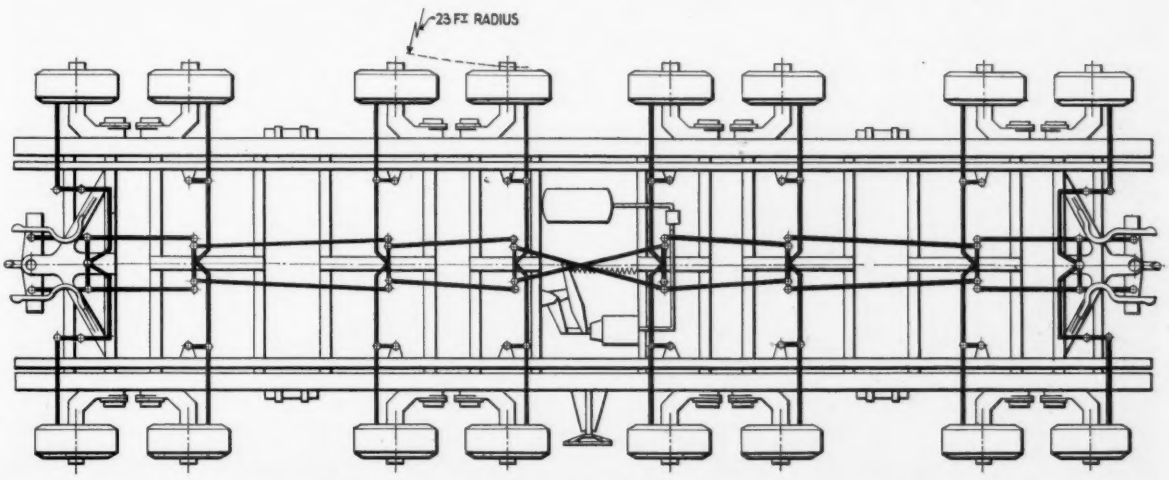
The problem of providing improved door-to-door delivery services has received considerable attention by the S.N.C.F., both from the point of view of experiments conducted by other railways, and from foreign equipment, as a result of which two further types of trailers have been built by Etablissements Arbel, of Paris, for the S.C.E.T.A., the road transport subsidiary of the French National Railways, consisting of one-piece underframes, instead of bogies. They are capable of carrying a net load of 30 or 40 tons, and differ only in the method of suspension and wheel arrangement.

The trailers are normally capable of taking all two-axle wagons, which constitute more than 90 per cent of Continental goods stock; bogie wagons can also be transported, but in a less general manner. In 1951 the trailer system carried some 220,000 short tons, which figure increased to 275,000 short tons in 1952; an increase is anticipated during the current year. Two characteristic hauls was one of five miles with gradients of 1 in 10, in the Puy-de-Dome, and in October, 1952, some 12,300 short tons, comprising different types of merchandise, were transported to a factory in Paris between 07.30 and 19.00 hr., representing the daily transport across Paris of almost a complete train.

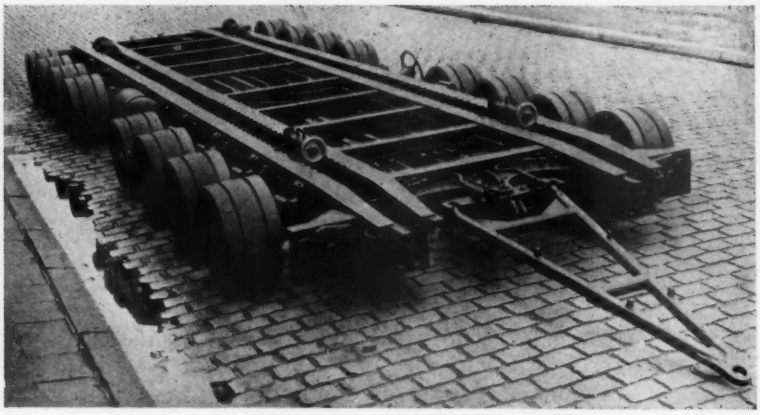
Trailer Design

The trailer underframe is made up of cross-members and two longitudinal girders supporting the rails. These girders have at each end a roller-bearing designed to maintain the underframe at a constant height during loading or unloading operation by means of a small ramp on which it mounts; the wagon is

Diesel tractor hauling loaded twelve-wheel trailer



Plan of sixteen-wheel Arbel trailer, showing the steering mechanism



Sixteen-wheel trailer, showing compressed air braking, coupling, steering gear, and spring suspension

immobilised on the rails of the trailer by means of four securing jacks. Wheels are of cast steel, fitted with rubber tyres. The load on each wheel is:—

$\frac{114,600}{16}$ = 7,162·5 lb. (in the case of the 16-wheel trailer);

$\frac{99,000}{12}$ = 8,250 lb. (in the case of the 12-wheel trailer).

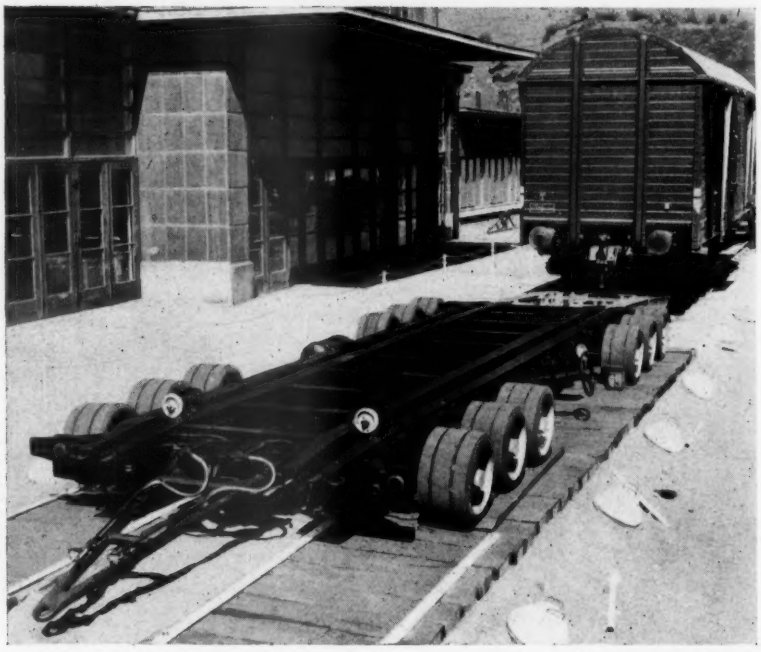
The wheel journal hub component is supported (1) by an oscillating half-axle, or (2) by a crank-shaped axle. The axles operate (1) through the intermediary of connecting rods, levers, and torsion bars, and (2) by spiral springs, which form the flexible part of the trailer. To distribute the load equally on each wheel the suspension springs are balanced in groups by a system of rods and levers. It is claimed that the load is distributed uniformly, even when one of the wheels passes over an obstacle 4¼ in. in height, or drops into a hole of similar depth.

All wheels are steering, their movement being controlled through the intermediary of a system of connecting rods. On curves all the wheels turn in such a way as to allow each to follow the tangent of a circle concentric to the average trajectory of the trailer. Three braking systems are fitted, functioning either by direct braking operated from the tractor, normal braking; automatic braking in the case of a broken coupling; or by hand braking operated by a wheel (immobilisation when stopped).

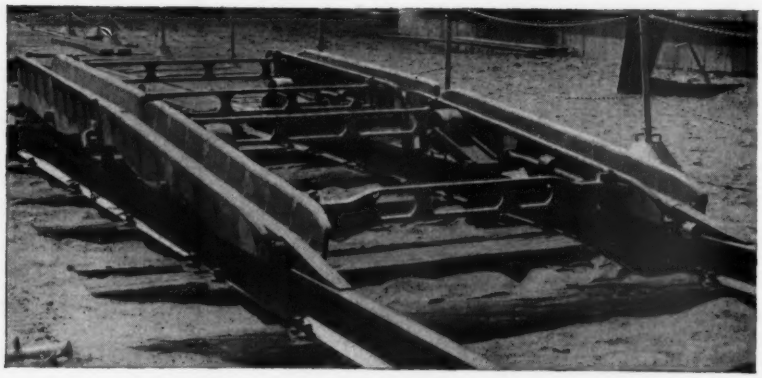
The tractors required for the services develop from 100 to 150 horse-power, and have five speeds between 0 and 15 m.p.h., compressed-air brakes are fitted with high capacity reservoir, a rapid reversible winch together with 328 ft. of cable. The maximum speed for two-axled wagons is 15·5 m.p.h. and for bogie wagons 3·7 m.p.h.; the normal operating speeds are 7·5 and 1·8 m.p.h. respectively.

Loading and Unloading of Wagons

Loading of wagons from the railway track to the trailer is normally carried out by means of a mobile ramp, the end of which is of the same height as the trailer. A set of points at the loading ramp enables loaded wagons to be placed on a short section of track, while a second track is reserved for empties. In the event of only one track being available a mobile ramp of light-weight metal can be used to load a wagon from the track to the trailer.



Trailer with mobile ramp in position at far end for loading wagon from railway track



Lightweight mobile ramp affixed to railway track

To reduce the trailer immobilisation period at the consignee's premises, a device in most general use consists of a mobile off-loading track which can be moved within the premises being serviced. This consists mainly of 29·5 ft. of track of the same height as the rails of the trailer. This device is fitted with two retractable wheels and can be moved very easily.

Other arrangements to reduce the immobilisation of equipment are envisaged as soon as the volume of traffic justifies further expenditure.

New Ticket Sale and Reservation Methods

Applications of photo-telegraphy and microfilms in Pennsylvania Railroad Pittsburgh bureau

A NEW time-saving system for selling railway tickets and making train reservations has been introduced by the Pennsylvania Railroad at Pittsburgh. Designed to cut drastically the average time required to make a reservation and purchase a ticket on trains out of Pittsburgh, it is centred in a new type of ticket sales and service bureau in the main waiting room of the Pennsylvania Station in which all counter, reservation and information representatives are stationed.

Pre-printed theatre-type Pullman and reserved coach space coupons—one for each unit of reserved space on trains leaving Pittsburgh—are arranged under the hands of reservation representatives in special racks by train and date, with coupons of different colours differentiating the type of accommodation. A ready-sale board, visible to the public and all sales personnel, shows by letter and colour the accommodation available for each train for one week in advance. When the desired space is selected, the traveller is given a pre-printed space coupon, instead of a hand-written coupon. The space coupons are printed weeks ahead and placed in readily visible and accessible trays.

Simplified railway tickets are printed automatically by a new ticket-issuing machine called the Ticketeer, again eliminating hand-written entries.

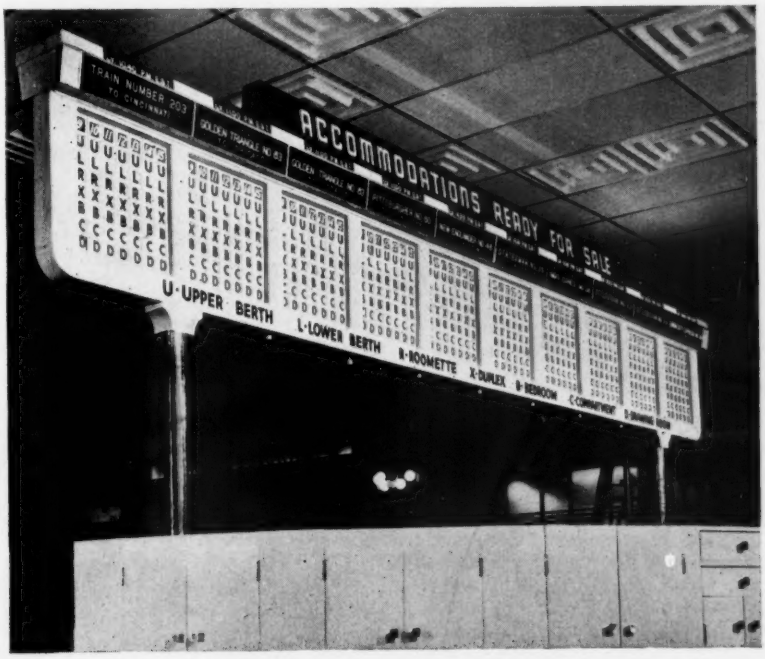
A unique ticket communication system has been established between the central ticket sales and service bureau and two other ticket offices in the Pittsburgh area. Special machines made by Western Union to reproduce Pullman space coupons by telegraph allow reservation coupons to be transmitted from the central office to the other two points. Operating on a principle similar to photo-telegraphy, a facsimile of the space coupon is sent from one point to the other in less than a minute.

To save still more time, routes and fares to some 6,500 railway points throughout the country have been microfilmed and filed in such a way that the information can be obtained for any point within four seconds. A separate sales and service lounge is provided for those who wish to make reservations or buy tickets for long journeys over more than one railway, and others whose requirements need special handling.

Space Coupons

The essential feature of the new ticket system is the pre-printed space coupon. A coupon is printed weeks in advance for each unit of space listed on the Pullman diagram. The coupons, printed in colours to designate the different types of accommodation, show: (1) the car number; (2) space number or letter; (3) train number and name; and (4) origin and destination (in case of a short sale, which is the exception rather than the rule, space is provided for writing in the intermediate point of origin and/or destination).

Using a magnifying projector to consult route and fare information filed in microfilm form



Indicator showing types of accommodation available for reservation on principal trains for a week ahead

Because of the colour distinction in the coupons, the sales representative can tell at a glance whether a roomette, for example, is available on any given train. A six weeks' inventory of these coupons, pre-dated and numbered, is sorted in four tub files in the centre of the bureau.

Since approximately 75 per cent of the reserved space transactions actually occur within seven days before the departure of trains, the tub file containing the current seven-day inventory of tickets is located directly behind the service counter. Behind the current seven-day file, away from the service counter, is the second seven-day file, which will account for approximately 11 per cent of the activity of the bureau. Since there is relatively little reserved space activity in the third, fourth, fifth and sixth weeks, two files, each holding fourteen days' inventory are placed farther back in the bureau. Most telephone calls for information will be directed to these last two locations. Thus, interference with the very active first and second week files is avoided.

Space coupons are stored in portable trays, each line of trays representing one day. At the close of the day, after all trains have departed, the tray for that day is removed, and reloaded with

coupons for all trains for the day six weeks ahead. All trays are moved forward so that today's tray of coupons is always in the same position, which is closest to the service counter. The seventh day is moved from the second week's file over to the first week's file, and so on, down the line.

Ready-Sale Board

The ready-sale board is approximately 17 ft. long by 3½ ft. wide and is supported by two uprights so that its lower edge is 6 ft. 2 in. above the floor. It is readily visible to over-the-counter customers as well as to the sales representatives. It indicates the accommodations ready for sale during the current week on 10 of the most popular trains serving Pittsburgh.

Under the name of each train are seven vertical rows of blocks, one for each day of the week. These blocks display letters denoting the type of reserved space on a train.

Colours of the letter, which may be changed by rotating the blocks, indicate whether space is plentiful, scarce, or sold out. This valuable quick visual information is made available to ticket offices connected with the bureau by Western Union facsimile machines. A reproduction of the information on the board is transmitted periodically by wire to these other sales points.

Facsimile Coupon Transmission

At present the Western Union facsimile process for sending reserved space coupons and other information by wire is available at two branch offices. For example, a customer enters a branch office and requests space for New York. The sales representative fills in an application form. This form is wrapped round a cylinder in the Intrafax unit. A photo-electric cell provides the impulse whereby the application is transmitted to the central ticket bureau. The sales respresentative there selects the coupon for the desired space, tears off the stub, marks the destination station, and wraps the coupon around the cylinder of his machine. This machine then sends a facsimile of the space coupon back to the branch office where the application originated.

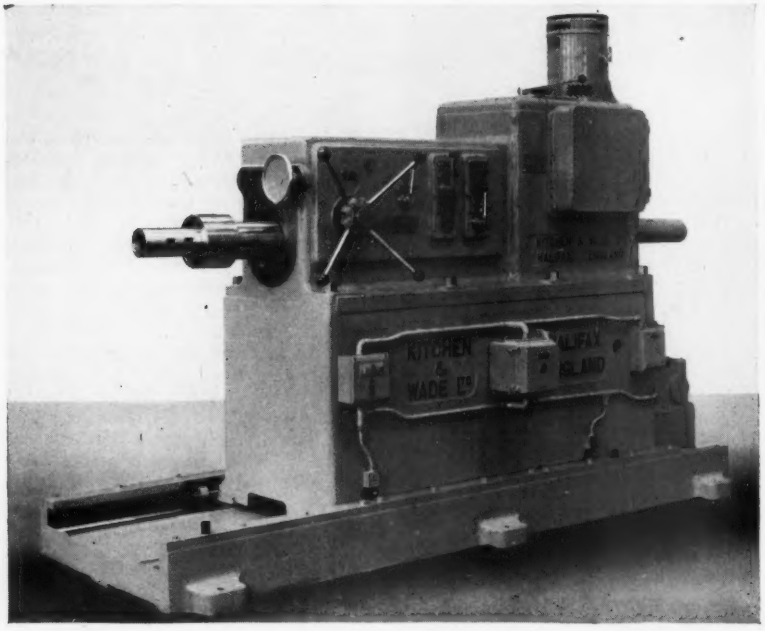
Structural Design

An unusual type of canopy provides an acoustical ceiling and the means for lighting the bureau. It is suspended from the roof by thin steel cables, and is flat but bevels up 8 in. around the outer rim which extends 3 ft. outside the perimeter of the bureau itself. The outer 5 ft. of the canopy are plywood with a Formica finish. The remainder of the canopy is composed of acoustical tile in which fluorescent lights are recessed.

Recessed spotlights are located in the outer rim over the ticket counter only. The canopy covers 1,927 sq. ft. and weighs approximately 5,700 lb.

Horizontal Universal Borer

With fixed or movable base for boring up to 24-in. diameters



Kitchen & Wade horizontal, heavy-duty boring, facing, and drilling machine, movable base type

IN the heavy engineering industry occasions sometimes arise when machining of forgings and castings by the normal designs of horizontal boring and drilling machines presents certain difficulties. To cater for such conditions, Kitchen & Wade Limited has recently designed a type of heavy-duty horizontal, universal drilling, boring and facing machine, capable of taking large components. It is made in two distinct designs, although the major features are common to both, such as capacities for boring, facing and drilling, which are 24 in., 30 in. and 4 in. respectively.

The two models can be supplied with fixed or movable base, either right- or left-hand; the type shown in the accompanying illustration is the movable-base design. The main drive is by a 15 or 20-h.p. motor, depending on the duty for which the machine is required. Drive is through a gearbox and double gear motion to the spindle drive worm and wheel.

The worm is of hardened steel with profile ground teeth, and the hobbed wormwheel is of high-grade phosphor bronze.

Spindle speeds have a range of from 3 to 180 r.p.m. The spindle is 4 in. dia. in the drive part, and increases in diameter to the nose end which is bored to suit No. 6 morse taper. It rotates in a hard steel sleeve which gives firm support to the spindle when cutting in an extreme position.

The length of feed is 3 ft.; the moving base machine has a further 3 ft. of travel in the direction of the spindle feed by rapid power traverse, and may be increased if desired. Quick adjustment to the spindle is provided by four-lever control on the front of the head. A slight forward movement of any of these levers engages one of the power feeds.

Feed Ranges

Feeds range from 0·0025 to 0·072 in. per revolution of spindle. Reverse motion to the feed is fitted for back facing operations; a hand-feed wheel is located close to the spindle. Automatic lubrication is provided for all gears, bearings, and slideways. The net weight of the fixed head machine is 4½ tons, and the moving-head machine 7 tons 8 cwt.

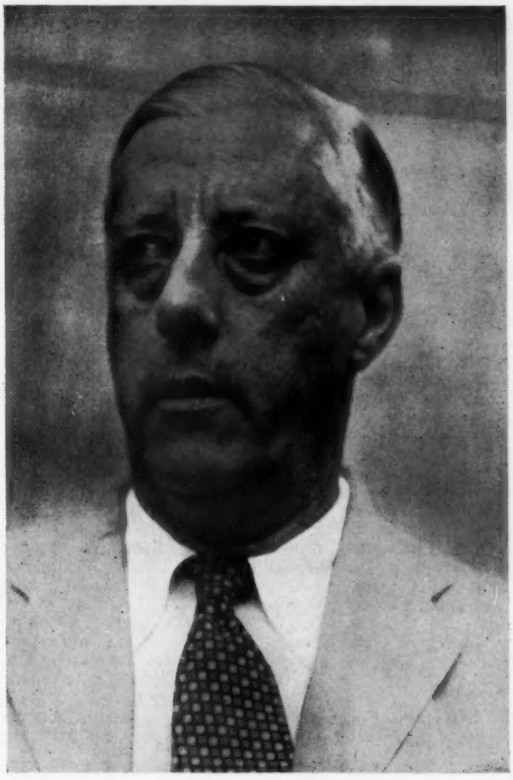
The vertical height from the centre of spindle is standard in both designs. All the machine controls are within easy reach of the operator to reduce fatigue.

RAILWAY NEWS SECTION

PERSONAL

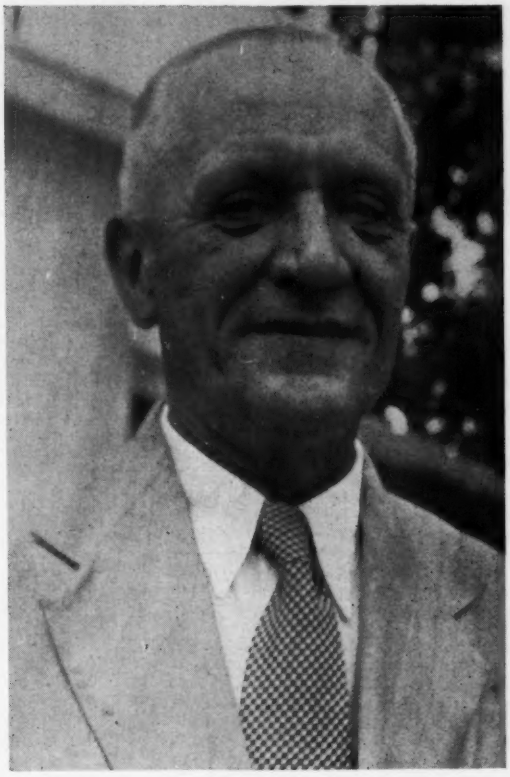
Mr. K. A. Smith, A.M.I.Loco.E., has been appointed Chief Mechanical Engineer, Commonwealth Railways, Australia.

Mr. W. H. W. Maass, Personnel Engineer, Mechanical Engineering Department, South African Railways, Pretoria, has been appointed Advisory Engineer, South African Railways, London.



Mr. T. B. Welch

Chief Mechanical Engineer, Nigerian Railway, 1942-53



Mr. C. W. Putsey

Chief Superintendent (Operating & Commercial), Nigerian Railway, 1951-53

Mr. T. B. Welch, Chief Mechanical Engineer, Nigerian Railway, who, as recorded in our June 26 issue, retired last May, completed five years at Brighton Running Shed, London, Brighton & South Coast Railway, as Assistant Locomotive Superintendent before being appointed to the Nigerian Railways in the same capacity in June, 1923. Mr. Welch was promoted to be Assistant Divisional Superintendent (Locomotive) in 1928. He frequently acted as Superintendent, Motive Power, before his acting appointment as Chief Mechanical Engineer in 1940. Mr. Welch was confirmed as C.M.E. in 1942. He was responsible for the main features of design of the "River" class locomotives, now the standard medium axle-load locomotive for Colonial railways. He was also responsible for the new first-class sleepers and composite vehicles, third-class coaches and hopper wagons.

Mr. C. W. Putsey, Chief Superintendent (Operating & Commercial), Nigerian Railway, who has retired, began his railway career with the North Eastern Railway in the Dock Traffic Agent's Office, Victoria Dock, Hull, in September, 1912. He was transferred to the District Superintendent's Office, Hull, and subsequently saw service in the Yardmaster's Office, Hull East, and the Stationmaster's Office, Hull Paragon, before joining the Forces during the 1914-18 war. After 3½ years' war service he was attached to the District Superintendent's Office, Hull, and passed through all sections of that office before joining the Nigerian Railway as Traffic Inspector in September, 1927. He was promoted Assistant Traffic Officer, and later became District Traffic Superintendent and Assistant Traffic Manager. Mr. Putsey was appointed Chief Superintendent (Operating & Commercial) on the formation of the Operating & Commercial Department in 1951.

Irish Railway Board

The composition of the new board of the Great Northern Railway (Ireland) Company, referred to elsewhere in this issue, which was announced when representatives of the Governments of Northern Ireland and the Irish Republic signed the agreement of joint acquisition in Belfast on August 10, is as follows:—

*Northern Ireland Members**:

Mr. G. B. Howden, M.I.C.E., M.Inst..T. (Senior Member), Chairman of the Ulster Transport Authority and until now General Manager of the G.N.R.(I.).

Mr. A. G. Algeo, C.B.E., J.P., former President of the Ulster Farmers' Union.

Mr. J. E. Finney, Director of Moygashel Limited.

Mr. S. J. McCoubrey, M.B.E., trades union representative.

Mr. J. S. Rogers, Past-Chairman of the Ulster Transport Authority.

Irish Republic Members:

Mr. A. P. Reynolds (Senior Member) Chairman of C.I.E. 1945-49.

Mr. James M. Carroll, Chairman of P. J. Carroll & Co. Ltd., and until now a Director of the G.N.R.(I.).

Senator William McMullen, former General President, Irish Transport & General Workers' Union, and now a member of the Council of the Institute for Industrial Research & Standards.

Mr. M. F. Molony, Managing Director of Martin Molony & Sons (Ireland) Ltd. and a Director of several clothing and builders' contractors firms.

Mr. Martin O'Sullivan, P.C., former Labour Member of the Dail and Lord Mayor of Dublin, 1943-45, Member of the Dublin Port & Docks Board since 1932, and Chairman of the Board, 1946-48.

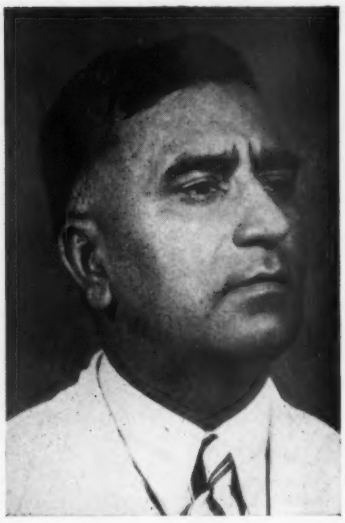
*All the members for Northern Ireland are also members of the Ulster Transport Authority.

The Minister of Transport has reappointed Sir John Benstead and Lord Rusholme as full-time members of the British Transport Commission for a period of five years from September 1.

XUM

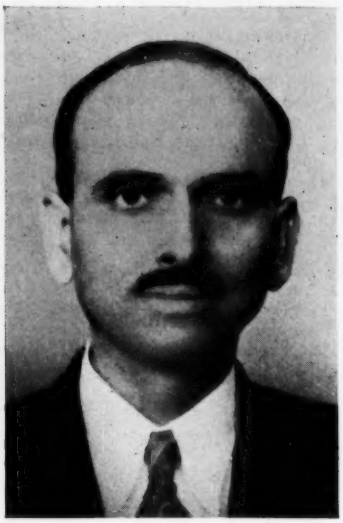
Mr. P. N. Mubayi

Appointed Chief Government Inspector of Railways, India



Mr. R. C. Sood

Appointed Government Inspector of Railways, Bombay, India



Mr. D. C. Desai

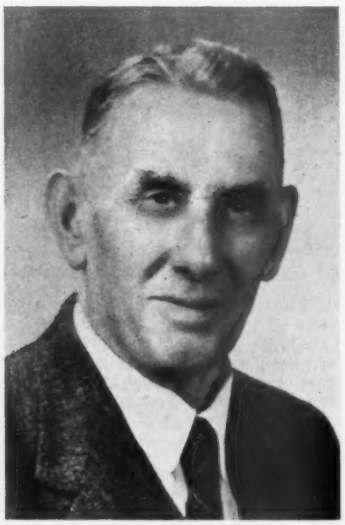
Appointed Government Inspector of Railways, Calcutta, India

Mr. P. N. Mubayi, C.E. (Hons.), F.P.W.Inst., M.I.E. (India), who, as recorded in our July 31 issue, has been appointed Chief Government Inspector of Railways, India, was born on December 31, 1901. He was educated at Government College, Lahore, and Thomason Civil Engineering College, Roorkee. Mr. Mubayi entered the service of the North Western Railway in 1923, with which system he completed a year's apprenticeship. He was subsequently appointed by the Secretary of State for India to the Indian Service of Engineers, State Railways, becoming an Assistant Executive Engineer in 1924. He worked as Sub-Divisional Officer on Open Lines. Mr. Mubayi was transferred to the Projects & Designs Section at Headquarters Office upon its formation in 1928, and, in 1930, he was transferred to the East Indian Railway as Assistant Superintendent, Way & Works, subsequently becoming Assistant Personnel Officer in several Divisions. In 1935 he was promoted to the rank of Executive Engineer. In 1937, Mr. Mubayi visited Europe, where he studied railway working and, in 1938, he was appointed Divisional Personnel Officer. In 1940, he became Senior Personnel Officer at Headquarters. Between 1940 and 1945 Mr. Mubayi held the offices of Superintendent, Way & Works, Senior Superintendent, Way & Works, and Divisional Superintendent. He was selected by the Post & Air Department of the Government of India to be in charge of railway inspection in the Balgalore and Calcutta Circles. In 1947 he was appointed Government Inspector of Railways "Senior" at Bombay.

Mr. R. C. Sood, who, as recorded in our July 31 issue, has been appointed Government Inspector of Railways, Bombay, India, was born in December, 1903, and was educated at Gordon College, Rawalpindi, and Government College, Lahore. After graduating from the Thomason Civil Engineering College, Roorkee, in 1926 he was appointed as an Assistant Executive Engineer in the Indian Railway Service of Engineers in March, 1927, and was posted to the old East Indian Railway. In 1940 he was promoted as an Executive Engineer and served in this capacity at Dinapore and Asansol. In 1941 he was appointed as a Divisional Personnel Officer at Moradabad. From 1942 to 1945 he worked as Executive Engineer on important construction works for increasing the capacity of the line, including the quadrupling of the track between Khana and Asansol, increasing line capacity between the Gomoh and Kargali coalfields and re-

Mr. G. F. Huskisson

Appointed Assistant Commercial Superintendent (Development), Liverpool Street



Mr. William Cole

Divisional Transport Officer, N.E. Division, National Coal Board, 1947-53

The late Mr. F. H. Pank

Chief Mechanical Engineer, Central Argentine Railway, 1939-46

modelling the Asansol and Ondal Yards. From 1945 to 1947 he worked as Senior Superintendent, Way & Works, at Dinapore and Howrah. In March, 1947, he was appointed as Deputy General Manager of the East Indian Railway. In July, 1948, he was transferred to the Railway Inspectorate under the Ministry of Communications and was appointed as Government Inspector of Railways, Calcutta. He was transferred to Bombay in February, 1953, in the same capacity.

Mr. D. C. Desai, B.E.(Bom.), M.I.E. (Ind.), A.M.I.Struct.S.(Lond.), E.P.W.Inst., who, as recorded in our July 31 issue, has been appointed Government Inspector of Railways, Indian Railways, was born on May 10, 1907, and educated at the Arts, Science & Engineering Colleges in Surat, Ahmedabad and Poona. He was awarded the first prize at the B.E.(Civil) Degree Examination of the University of Bombay for Project & Design. Mr. Desai was appointed as a Civil Engineer in 1928 by the Bombay Government and posted at Karachi. On May 25, 1929, he elected to join the Indian Railway Service of Engineers and was posted to the East Indian Railway. He served in various capacities, including those of Executive Engineer, Track Supply Officer, Land Control Officer, Bridge Engineer and Deputy Engineer-in-Chief (Construction) on this railway for a period of 20 years. In December, 1948, Mr. Desai was selected by the Government of India, Ministry of Communications, for direct appointment as Government Inspector of Railways and was posted to Bangalore. During the last five years, Mr. Desai has been in charge of Bangalore and Calcutta Circles alternatively and was promoted to the post of Senior Government Inspector in February, 1953. He is now in charge of the Calcutta Circle which comprises the Eastern Railway and two-thirds of the North-Eastern Railway, besides fourteen light railways.

Mr. G. F. Huskisson, Assistant District Goods Superintendent (London Suburban), Gordon Hill, Eastern Region, British Railways, who, as recorded in our July 31 issue, has been appointed Assistant Commercial Superintendent (Development), Liverpool Street, was educated at Merchant Taylors' School and entered the service of the London & North Eastern Railway as a clerk at Loughton in September, 1934. After serving at various suburban stations, he was transferred to the Passenger Manager's Office, Liverpool Street, in November, 1936. He remained here until September, 1937, when he was appointed to a position in the Chief General Manager's Office, L.N.E.R., Kings Cross, which he held until he became a Traffic Apprentice in July, 1938. He served with H.M. Forces in the Royal Engineers (Transportation) from September, 1939, until April, 1946, and reached the rank of Lt.-Colonel. He was mentioned in Despatches for service in Burma, where he commanded No. 1 Railway Operating Group, Indian Engineers. Mr. Huskisson resumed duty in May, 1946, as Deputy Head of the Development Canvassing Section, Passenger Manager's Office, Liverpool Street, becoming Head of the Section in March, 1947. He was appointed Head of the Development & Statistical (Passenger) Section, Commercial Superintendent's Office, Liverpool Street, in April, 1949. In June, 1951, Mr. Huskisson was appointed Assistant District Goods Superintendent (London Suburban) Gordon Hill. After the war Mr. Huskisson commanded a Railway Traffic Squadron, Royal Engineers, of the Army Supplementary Reserve.

Mr. William Cole, Divisional Transport Officer, North Eastern Division of the National Coal Board, who is retiring on August 31, is a native of Highley, Shropshire. Mr. Cole began his career with the Highley Mining Company over 50 years ago, and has served the whole of his life in colliery transport. During the 1914-18 war he served with the Royal Engineers, and, in 1917, transferred to the Ministry of Shipping and appointed Principal Assistant to the Chief Transport Manager at Portbury, Chepstow and Beachley Shipyards. In November, 1919, he was appointed Joint Transport Manager of the Wernddu Mineral Railway Company and Judd, Budd Limited, Coal Exporters, London. In 1922 Mr. Cole was appointed Transport Manager to the Powell Duffryn Steam Coal Company, Aberdare, and came to Yorkshire in 1927 in charge of the transport and wagon shops of the Amalgamated Denaby Collieries; he was appointed General Manager of his department in 1945. On nationalisation of the coal industry in 1947 he was appointed Divisional Transport Officer of the North Eastern Division, from which position he will retire. During the 1939-45 war Mr. Cole served as a member of the Advisory Committee to the Ministry of War Transport on privately-owned requisitioned wagons, and was the representative of the South Yorkshire Coalowners on all transport committees of the Mining Association of Great Britain.

We regret to record the death, on July 17, at the age of 71, of Mr. F. H. Pank, Chief Mechanical Engineer, Central Argentine Railway, 1939-46, while returning to this country from the Argentine. Mr. Pank entered the service of the Central Argentine Railway in October, 1907, as a draughtsman in the Rosario workshops. He was later transferred to the company's workshops at Rio Churto, returning to Rosario in March, 1915, as Assistant Locomotive Works Manager. In the same month he volunteered for active service and proceeded to England, where he joined the Royal Garrison Artillery, in which he held the rank of lieutenant. On his return to Argentina in 1919 he resumed his duties with the railway as Assistant Locomotive Works Manager. In 1925 Mr. Pank was promoted Locomotive Works Manager at Perez, and, in 1931, he became Assistant Chief Mechanical Engineer. He was appointed Chief Mechanical Engineer in 1939. In 1937 he was entrusted with a special mission to Hungary in connection with the purchase of the company's Ganz diesel railcars.

Mr. W. H. Mills, M.B.E., Assistant Secretary, Railway Executive, whose death was recorded in our August 7 issue, began his railway career in 1911 as a junior clerk at the Railway Clearing House, where he remained until he was appointed Assistant Secretary of the Railway Executive Committee in December, 1946. He undertook additional responsibilities when the Secretary of the R.E.C., Mr. E. G. Marsden, was released to become Secretary of the Railway Executive in October, 1947. He was appointed Assistant Secretary, Railway Executive, on January 1, 1948.

The following were present at his funeral, which took place on August 7 at Putney Vale Crematorium:—

Messrs. S. B. Taylor, Chief Secretary, British Transport Commission (also representing the British Transport Commission), E. G. Trangmar (also representing Mr. John Elliot), H. J. Locke (also representing Mr. J. L. Harrington), G. Wynne Davies (also representing Mr. A. J. Pearson), D. F. Gowen (also representing Mr. W. P. Allen), David Blee, Sir Michael Barrington-Ward, Mr. R. C. Bond (also representing Mr. R. A. Riddles), Dr. F. F. Curtis (also representing Mr. J. C. L. Train), Messrs. A. Forbes Smith (also representing General Sir Daril Watson), V. Radford, E. G. Marsden, L. A. A. Taylor (also representing Mr. A. Endicott), T. J. Lynch, W. S. Cutler and six others, Railway Clearing House, W. Brown, Assistant Accountant, Eastern Region (also representing Mr. C. K. Bird, Chief Regional Officer, Eastern Region), F. C. Howard, Assistant to Chief Regional Officer, London Midland Region (also representing Mr. J. W. Watkins, Chief Regional Officer, and Mr. E. S. Hunt, Assistant Chief Regional Officer), Captain J. D. Reed, Manager, Irish Shipping Services, Messrs. R. W. Bailey, Assistant Regional Staff Officer, London Midland Region, T. L. R. Presland, Assistant (Audit) to Accountant, London Midland Region, H. B. Taylor, Assistant Operating Superintendent, Southern Region (also representing Mr. C. P. Hopkins, Chief Regional Officer, Southern Region), H. G. Bowles, Assistant Chief Regional Officer, Western Region (also representing Mr. K. W. C. Grand, Chief Regional Officer, Western Region).

There were also present members of the Secretary's and other departments.

An Appreciation

The sudden death of Walter Henry Mills leaves a gap that no-one can fill, domestically, personally, professionally. He joined the Railway Clearing House over 40 years ago and his fidelity to that great institution was constant throughout life, although in later years his work was performed elsewhere. Apart from his own genius, his success was inspired by traditions absorbed in Seymour Street, and sad will be the day for transport if those traditions are lost.

From earliest years Walter Mills had wished for a literary career, and, although this was not to be, his desire, strengthened by solid reading, particularly in the works of the critics and essayists of the 18th and 19th centuries, was pursued with that calm will so characteristic of him. How nearly he succeeded in authorship, few know. His talent for writing and his facility for reducing most complex discussions to concise proportions with absolute clarity distinguished his daily work.

He regarded his active service in the war of 1914-18 as duty done, but his service with the Railway Executive Committee in the 1939-45 war was outstanding and led to his appointment as Acting Secretary of that body in the latter part of 1947. The award of the M.B.E. in 1948, when he had been appointed Assistant Secretary of the Railway Executive, was acclaimed by all who knew his merit.

Hard as the work at Marylebone has been he never complained, was always unruffled and full of kindness. These last five-and-a-half years have brought him into relationship with an ever-widening circle of colleagues whose affection for him has deepened with the years and to whom his loss is grievous. A man of wide interests, happy in his family life and proud of his children's achievements, his spirit was one which could not but "dwell on the upper parts of the earth."

He has gone from us in his prime. The golden bowl is broken. How hard it is for mortals to comprehend.

E.G.M.

XUM

Ministry of Transport Accident Report

Guildford, November 8, 1952:
British Railways, Southern Region

Brigadier C. A. Langley, Inspecting Officer of Railways, Ministry of Transport, inquired into the accident which occurred at about 10.34 p.m. on November 8, 1952, at Guildford, when the rear section of the 8.54 p.m. electric passenger train from Waterloo got out of control owing to a brake failure and collided with a light engine. The section consisted of two-coach close-coupled set No. 2133, which had been detached at Ascot and had formed the 9.46 p.m. train from that station to Guildford *via* Aldershot. Getting out of control on the falling gradient of 1 in 100 from Pinks Hill box when approaching on the up Alton line, owing to brake failure arising from loss of air pressure after the blowing of a compressor governor fuse, the coaches overran Guildford Yard box outer and inner homes and entered the down-line through a crossover, when they collided with class " B " 0-6-0 tender light engine No. 30693, which was moving towards the up main line and for which the crossover had been reversed.

The engine was pushed back for nearly 30 yd. and its tender badly damaged. Much damage was done to the leading coach of the train, its first half being destroyed, but the second suffered hardly any damage. The front vehicle came to rest to the right against the tender of another light engine in a siding. The motorman and one of the 65 passengers were killed and 37 suffered injury or shock, of whom 6 were detained in hospital. Assistance of several kinds arrived speedily and the last casualty was conveyed to hospital by 11.30 p.m.

Up and down Alton lines were blocked and their circuit-breakers tripped on short circuit. On replacement, that for the down line remained closed until the line was isolated by the electrical controller at 10.39, which was surprising, but the conductor rail happened to be protected on each side by wooden boards. Nevertheless no one received shocks or burns. Normal service was resumed by 7 a.m. next day. The weather was fine and dry and the night clear. The accompanying diagram shows the lines, signals and other details essential to an understanding of the case.

The up Alton line runs from north to south into Guildford, but the up main in the opposite direction. The passenger train was due to run through crossover 39 to the down Alton line and thence to platform 8, used as a terminal for electric trains to and from Ascot.

The two coaches had standard Westinghouse brakes operating non-ferrous blocks except on the motor bogie which had cast iron and the power exerted in working order was 43·6 tons or 57·4 per cent of the tare weight of 76. There was a wheel hand brake in the driver's cab at each end of the set but not in the guard's compartment. Air was furnished by an electric compressor on the motor coach and was used also to work the electro-pneumatic main power contactors.

Evidence Regarding Train Running

The signalman at the Yard box accepted the train at 10.24 and received "entering section" 6 min. later. He intended to cross the light engine from the locomotive yard directly after the 10.30 Guildford to Ascot train had passed. That left on time, and when the describer bell rang from the yard he set the route for the engine and cleared signal 75. Replacing that signal he heard a rattle of levers, followed by the crash of the collision. He heard the annunciator ring when the train reached the outer home berth track, where usually he had to hold it on a Saturday night. He did not notice the ringing stop nor see the next track circuit section light up on the diagram, being busy at the other end of the frame, while engines were making a good deal of noise. He did not see the train or hear its whistle.

The signal lad confirmed this. He saw the train approaching at high speed too late to warn the signalman and heard no whistle: neither did he see the motorman.

Neither driver nor fireman of the engine saw the train. They were moving at about 5 m.p.h. and were knocked down by the collision.

Guard's Evidence

The motorman and guard had taken charge at Ascot. The latter said he got into the van of the second 2-car set when it stopped and the motorman entered the cab just in front of him. The train was divided and the two leading coaches left for Reading. He reduced air pressure to 25 to 30 lb. from the van and it returned to normal, between 70 and 75 lb. This was witnessed by a porter. The journey to Aldershot, with four stops, was uneventful and they pulled up at the usual places on each occasion. Leaving Aldershot the train was checked at the north junction to take the facing connection and stopped at Ash in the normal way, and at Wanborough.

During the descent from Pinks Hill he expected a brake application at the distant signal but speed did not slacken and he felt uneasy and realised he had missed seeing the signal. Through his periscope he saw the outer home at red and made an emergency brake application without effect. The train gathered more speed and he saw the red inner home flash by. He was wondering whether to jump when the collision occurred. He could not recollect whether the air compressor was working at all after Ascot, or having looked at his gauge.

A railway employee travelling in the second coach, who was quite familiar with the route, said the train should have slowed down at about the by-pass bridge but seemed to gather speed. The coaches began rolling more than usual and others with him remarked on it.

It was confirmed by local staff that the train stopped at its usual places at the stations and its headlights were on. A porter at Aldershot thought he heard the compressor working and said the motorman appeared to be in good health and spirits.

The motorman who had driven on the previous up journey from Reading with the set said he had a perfectly good brake with no undue loss of air. He handed over at Ascot to another motorman, who said he drove from the trailer coach and noticed nothing unusual. The gauge was illuminated by the spotlight and appeared to be working correctly. The brakes operated satisfactorily. (The compartment this man used was leading on the final run, Aldershot to Guildford.)

Damage prevented the position of the controls at the time of the accident from being ascertained, and the reverser key was picked up on the track. The reverser under the motor coach at the rear was set for driving towards Guildford. Nothing showed the motors to have been reversed; had that been done it is probable the line switch would have sooted up and there would have been signs of a flashover on the commutators. The hand brake evidently was fully off, but the condition of the driver's air brake equipment could not be determined. The driver's brake valve in the motor coach was at " off " and the isolating cock correctly closed. There was no air in the brake system.

The guard's van emergency cock was open and an unknown person had pulled the communication chain. A test was then made and showed the brakes could be worked satisfactorily when the coach was recharged with air, and that there were full-bore exhausts in the guard's and passenger communication emergency valves.

The compressor governor fuse was found to have blown and when it was replaced the compressor operated satisfactorily. This would only stop the compressor while the train was running as a 2-car unit; X-ray photographs showed the condition of the fuse to have been consistent with having been overloaded, though not severely, perhaps by surging at conducter rail gaps. Failure of the brake from loss of air could not have happened until after the dividing at Ascot. Tests were made to find out the effect of this on the electrical controls and brake system.

Brake and Equipment Trials

The report sets out in detail the procedure adopted in these tests. The first were made with the motor coach involved to ascertain the effect on the electro-pneumatic main power contactors of gradual reduction of pressure after compressor failure, and showed a large reserve left to work them with main reservoir supply cut off. The next involved a series of brake applications, each made as far as practicable to give 25 lb. in the brake cylinder, records being kept of the train pipe, main reservoir, and other pressures, which are given in the report. This was possible up to 23 applications, after which the pressure began to fall. The triple valves would thus continue working and give effective braking, even when train pipe pressure had become very low.

Tests were then made with a standard 2-car motor and trailer unit to study the behaviour of the brake and electrical equipment on a train similar to the one concerned. Beginning with it fully charged, the compressor was cut out and a series of operations effected, as tabulated in the report, until loss of air stopped the tests; air brake power at the end was no better than a hand brake effect.

A special 2-car train was then run from Aldershot to Wanborough to check the operation of the master controller and brake under normal conditions, and again everything was recorded. A stop was made on the down gradient on the return journey from about 45 m.p.h. in approximately 1,430 yd. with the hand brake, and on a second occasion practically the same result was obtained by 5 lb. train pipe reduction, giving 12 lb. per sq. in. in the brake cylinder. Had the train been allowed to run freely from the coasting board it would, it was calculated, have attained about 55 m.p.h. at the point of collision.

On still another day, power, whistle and brake applications were noted on a regular 4-coach run, Ascot to Guildford, and the same sequence was repeated on a stationary 2-coach unit with reservoir fully charged, but the compressor cut out. The results, which again were tabulated, were very similar to those obtained in the second test above mentioned, and indicated that the main reservoir air was sufficient to enable such a unit to run without compressor from Ascot to Guildford.

As doubt had been expressed about the efficiency of the brakes of 2-car trains, tests were made to demonstrate the braking of both 2- and 4-car units. A run was made from Guildford to Ascot and back with two cars, making seven stops at speeds from 38 to 57 m.p.h. Then two more cars were attached and the test exactly repeated. The day was somewhat misty but the rails practically dry. On each occasion the brake was applied by releasing the dead man's handle and deceleration was remarkably smooth and rapid, the furthest distance run being 390 yd. from 57 m.p.h. down 1 in 60. These tests showed quite clearly that the brake efficiency was as high with two as with four cars.

Inspecting Officer's Conclusion

The signalman was in order in setting the route for the engine while the Ascot train was approaching, as the movement was fully protected. There was sufficient safety overrun for all normal contingencies. Evidence made it clear that the train ran past outer and inner homes at high speed. That the guard operated his emergency handle was substantiated; he could do no more after the air brake failed since the vans on these sets have no hand brake. He would have had little time in which to operate one. He might have reduced speed a little but could not have stopped the train. As the hand brake is intended for parking purposes only and there is one in the motorman's cab, Brigadier Langley sees no reason for duplicating it in the van.

The evidence covering the running of this particular set, from Reading to Ascot alone and then to Waterloo coupled to another and thence back to Ascot, again so coupled, showed that there was nothing wrong with the brakes, and confirmed also that the duplex gauge was registering correctly, and was illuminated, in the cab which was leading when the train got out of control. In the other cab of the same set the same condition of affairs was proved to have obtained, while all brake equipment on the motor coach of this set was in sound condition.

Even though the guard, when testing on the down trip at Ascot, should have done so from the trailer cab instead of the van, the results obtained were satisfactory, as it is known that the coupling cocks were open and, up to that moment, the brakes fully operative. The possibility of sudden and complete brake failure on the journey to Guildford can be ruled out, and the accident attributed only to loss of air from the main reservoir. Tests demonstrated that the stored air was just sufficient to work the brakes and contactors for the 23-mile journey from Ascot, although minor leaks might have produced somewhat earlier failure, and that the brakes would have effectively stopped the train even had reservoir pressure fallen to very low limits.

It seems likely that the fuse blew shortly after Ascot, or else while the set formed part of the 4-car train from there to Waterloo and back, with no effect on the compressor in those circumstances. The steady drop in pressure would have been shown on the duplex gauges in the driving cabs at each end of the train, while train pipe pressure drop would have registered also on the van gauge. The guard did not look at that after testing at Ascot and can hardly be blamed for it since the train had been handled in the usual way up to the Pinks Hill gradient.

The motorman, who was 62, and in good health, was thoroughly experienced, with 45 years' railway service—13½ as motorman—and a clear record. It is therefore very surprising that he did not notice the pressure drop on either of the gauges and Brigadier Langley concludes that he was so accustomed to rely on the integrity of the Westinghouse brake that he got out of the habit of watching the gauge regularly. Travelling in the dark he could not have realised that for the last few applications he must have been opening his driver's valve each time a little more than usual. There is no reason to doubt that he was keeping a proper lookout and made—with little effect—the usual light application at Guildford Yard distant. No doubt he eventually made a full one but had little time left for emergency action. The damage suggested that speed was less than 55 m.p.h. on collision and therefore the little air left sufficed to check the train slightly.

This conclusion is based partly on the well-known dependability of the brake but also on Brigadier Langley's own observation that the spotlights were not always showing on the gauges. Five out of seven he found not in focus and motormen told him that was the case in other cabs on this type of stock. They admitted they had never reported it; they carried a hand lamp and shone it on the gauges when necessary, but usually only when testing, or if they thought the brake to be not working efficiently.

Remarks

This accident was unusual and the first time it has been necessary to hold a Ministerial Inquiry into failure of a Westinghouse brake on electric stock. No fault can be found with a brake giving such operation as was shown in the tests. Temporary failures due to blown fuses must occur from time to time. The reserve of air on a 2-car unit after compressor failure is ample to cover these contingencies, as the tests proved. The duplex gauge—placed where it can easily be seen—should give ample warning of any air supply failure, but the fact remains that this motorman travelled many miles without realising his danger. Another disturbing feature was the inefficient focussing of the spotlight on the gauge at night and the little regard some motormen appeared to have paid to this essential safeguard. Prompt steps have been taken to remedy this.

The accident has demonstrated to the men the dangers which may arise if they fail in their duty of observing the condition of the equipment. The air supply will not be cut off from any part of it by failure of one compressor alone because all main reservoirs are connected throughout the train and the others are capable of supplying additional air. On a 2-car train, however, there is only one compressor and when it fails reliance must be placed on the reservoir reserve. No further warning than the gauge needles should be necessary, but Brigadier Langley considers a second desirable, to guard against the tendency to take matters for granted. The psychological effect of this accident also requires to be taken into consideration.

A number of devices, such as blown fuse

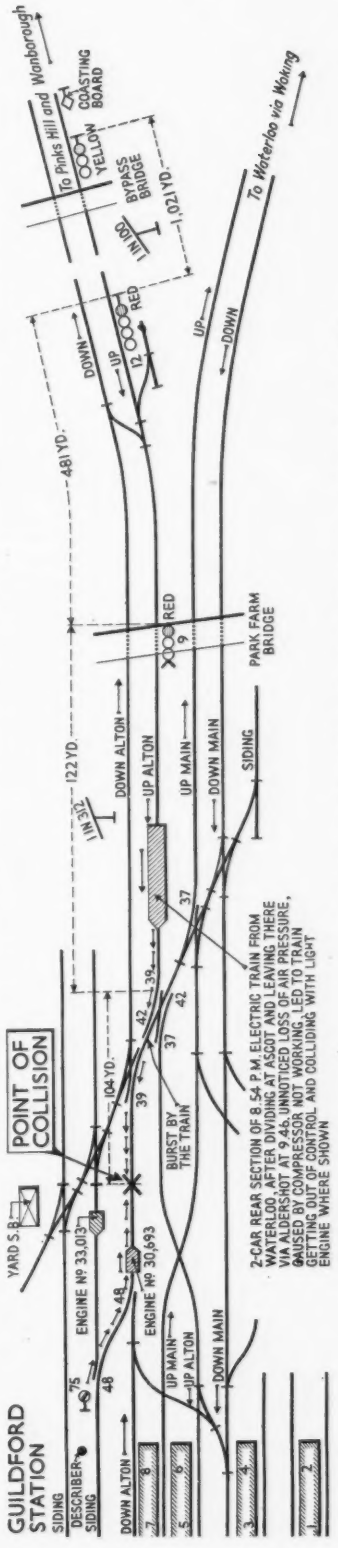


Diagram showing circumstances of accident at Guildford, Southern Region, on November 8, 1952

indicators, low air alarms, and so on, might be used, but the most suitable would be a control governor, as fitted on the more modern electric stock equipped with the ordinary Westinghouse brake, connected to the train pipe and cutting off traction power until pressure in it reaches a pre-determined amount. Positive in action, it ensures that the brakes are operative before power can be switched on and cuts it off when pressure falls below safe limits. Steps are being taken to fit all 2-car Southern Region units and new stock, and similar action will be taken where necessary on other electrified lines. This should ensure that such an accident cannot occur again.

[The report contains an appendix giving brake layout and circuit diagrams, a full description of the brake, as fitted on the rolling stock concerned, together with five tables of the results of the tests mentioned.]

French Railways Winter Timetable

The following alterations in French National Railways main-line services have been agreed provisionally, to take effect from introduction of the winter timetable on October 4:

Northern Region: The 8.15 a.m. boat express (Train No. 9) from Paris Nord to Calais, connecting with the 12.15 p.m. sailing to Folkestone, will be decelerated, to reach Calais Maritime at 11.53 instead of 11.44 as at present. The corresponding southbound train (No. 32), the 6.2 p.m. from Calais Maritime, will be due Paris Nord at 9.39 instead of 9.20; this train forms the southbound "Golden Arrow," which service will now give a transit time of 7 hr. 39 min. from Victoria to Paris. The Paris-Amsterdam expresses will be routed through Brussels over the Junction line, with stops at Brussels Midi, Central, and Nord. No alteration is envisaged in the schedules of the "Etoile du Nord," "Oiseau Bleu," and other trains between Paris Nord and Brussels Midi, and it is understood that their timings between Brussels, Antwerp, Rotterdam, The Hague, and Amsterdam will remain unchanged. Use of the Brussels Junction line will give good connections at Brussels Midi and Nord with many places in Belgium, whilst Brussels Central is in a convenient position in the centre of the city.

Lyons-Culoz Electrification

South Eastern Region: Inauguration of electric traction between Lyons and Culoz will facilitate accelerations between Paris and Lyons on the one hand, and Geneva and principal holiday resorts in Savoy on the other. Trains will be hauled electrically between Lyons and Chambery or Modane without change of engine. Thus Train No. 615 from Paris to St. Gervais (for Chamonix) will leave Paris Lyon at 9.40 p.m. instead of 9.15, reaching St. Gervais at 7.10 a.m. as now. Services are being improved between Paris and Vichy, Clermont Ferrand, and St. Etienne. Through coaches between Paris Lyon and St. Etienne *via* Lyons will give day journey times of 6 hr. 49 min. south- and 6 hr. 37 min. north-bound for the 356 miles, an improvement of about 40 min. each way over the existing schedule for through coaches between Paris Austerlitz and St. Etienne *via* Nevers and St. Germain-des-Fossés.

Improvements at Victoria, Southern Region

The accompanying illustration shows the canopy at the Hudson's Place entrance to Victoria Station, Southern Region, as it is after recent alterations. The entrance is at the Eastern Section booking hall and baggage registration hall for Continental services.

The proposal to remove the former, bomb-damaged canopy at Hudson's Place was discussed at a time when there was an acute shortage of steel. It was desired to leave as much as possible of the temporary canopy in place and at the same time reduce the number of stanchions which block the path adjacent to the Royal Waiting Room. The temporary canopy was supported from the old structure, and the simple solution was to reuse some of the old girders supported on old rail stanchions fixed above the awning and masked for its full length by a suitable name board; the result coincided with the renovation of the front of the existing buildings, presented a pleasing appearance, and was economical in construction.

Not the least satisfactory result of the arrangement is the complete removal of the old cast-iron columns in Hudson's Place, which previously made the manoeuvring of road traffic extremely difficult.

Reconstructed canopy over Hudson's Place entrance to Eastern Section booking hall and Continental baggage registration office at Victoria, Southern Region

Staff & Labour Matters

Railway Wage Claims

Representatives of the Railway Executive met representatives of the T.S.S.A., N.U.R., and A.S.L.E.F. on August 7 to hear the unions' arguments in support of their claim for an increase of 15 per cent in the rates of pay of railway workers. The railway unions have based their claim on the need to increase wages to keep pace with the rise in the cost of living.

A similar claim on behalf of railway shopmen was put forward by the employees' side of the Railway Shopmen's National Council at a meeting of the Council on July 30.

In both instances the Railway Executive has undertaken to consider the representations of the unions and to give a reply at an early date.

Engineers' Wage Claim

At a meeting on August 5 the national committee of the Amalgamated Engineering Union reaffirmed its support for an increase of 15 per cent in the rates of pay of engineering workers. The committee also supported the demand made the previous week that women workers in the industry should be given the adult male labourer's rate.

Parliamentary Notes

Compensation to Transport Employees

The Earl of Selkirk (Lord in Waiting) in the House of Lords on July 30 moved that the British Transport Commission (Compensation to Employees) Regulations, 1953, be approved. He said that the object was to enable the Minister of Transport to make regulations for compensation in cases which arose under the Transport Act. The regulations followed generally the pattern set up in the past and, in particular, the regulations of 1948 and 1950, affecting respectively railwaymen and persons employed in road haulage.

He drew attention to some of the differences from previous regulations. For railwaymen, the regulations followed closely those of 1948, with some improvements. Claimants might go straight to the tribunal, instead of going through the Commission; in computing interim payments only two-thirds of earnings were to be set off, instead of the whole; and in setting off unemployment or insurance benefits no account would be taken of dependants' and wife's allowances.

Paragraph 16 of the Second Schedule, Lord Selkirk pointed out, made it possible for the Commission to add an additional year of pensionable service for every year of service over the age of 40; so that any man who had served for 13 years over the age of 40 would be assured of almost his full pension rights on reaching the age of 65, according to the length of his service. He also said that the general regulations for pensions under Section 27 were in an

advanced state of preparation, and were now being considered by the trades unions.

Lord Burden said that the Opposition and the unions felt that the compensation provisions should apply as from May 1, 1952, the date of the White Paper on transport.

Lord Selkirk said he thought they could assume that the unions were not ill satisfied with the outcome of the negotiations they had conducted.

The motion was agreed to.

Investment in Railways

Answering Lt.-Colonel W. H. Bromley-Davenport (Knutsford—C.), who asked what was the machinery for a decision on the investment ceiling for railways and roads, Mr. Alan Lennox-Boyd (Minister of Transport) wrote in reply on July 31 that the amount to be allocated for investment was determined by the Government after consideration of proposals submitted by all departments concerned with capital investment.

British Shareholders of Manila Railways

Mr. W. Teeling (Brighton Pavilion—C.) on July 29 asked the Secretary of State for Foreign Affairs how far the Bill introduced by the Philippine Government to compensate British shareholders of the Manila Railways had got; and what representations H.M.G. would make to hasten proceedings.

Mr. Anthony Nutting (Joint Parliamentary Under Secretary of State for Foreign Affairs) in a written reply stated: "A Bill has been introduced in the Philippine House of Representatives which would authorise the Philippine Government to make a loan to the Philippine Railroad Company, in order to enable it to pay off its obligations to the bondholders. This Bill had not been adopted by either house of the Philippine Congress when the recent session closed on May 21, 1953. H.M.G. does not at present propose to make any representations to the Philippine Government, because it has not been asked to do so by the bondholders themselves."

British Transport Commission Act

The British Transport Commission Bill received the Royal Assent in the House of Lords on July 31.

WORLD BANK LOAN FOR URUGUAYAN RAILWAYS.—Reports published in the Uruguayan Press state that the Uruguayan railways have obtained a loan of $20,000,000 from the International Bank for Reconstruction & Development for the purchase of 38 locomotives and doubling between Montevideo and Canelones.

DIESEL ENGINES AND ELECTRICAL EQUIPMENT.—The products of the English Electric Co. Ltd. will be represented at the Engineering & Marine Exhibition, to be held at Olympia, London, from September 3-17, will be represented by a selection of diesel engines, fractional horsepower motors, industrial electronic equipment, switchgear, and welding equipment. The diesel engines will include types 8RLD, 1,100 b.h.p. at 428 r.p.m.; the 12SVT rail tractor diesel engine and generator, maximum continuous rating 1,500 b.h.p., speed range 420-850 r.p.m.; and the 6RK diesel engine of 372 b.h.p. at 600 r.p.m. Three types of industrial motors, the LY, XLK and KKS ranges, will be shown; the first comply with the new B.S.I. draft specification, CN(ELE)6814 for totally-enclosed fan-cooled, squirrel-cage motors. Mass X-ray and welding equipment will also be on view.

Contracts & Tenders

Orders have been placed for the following rolling stock for use on the Nyasaland Railways:—

Cambrian Wagon & Engineering Co. Ltd.: 65 high-side open and 39 covered bogie wagons

Gloucester Carriage & Wagon Co. Ltd.: Ten bogies for brakevans

Hurst, Nelson & Co. Ltd.: Two petrol tank bogie wagons

Henschel & Sohn G.m.b.h.: Nine "G" class 2-8-2 locomotives

British Railways, Eastern Region, have placed the undermentioned contracts:—

Walker Bros. (Wigan), Ltd., Wigan: supply and delivery of two standard Walker mobile cranes

Steels Engineering Products Limited, Sunderland: supply and delivery of two Model/99621 Coles full circle slewing diesel-electric railway container cranes

British Railways, North Eastern Region, have placed the following contracts:—

Bewley & Scott Limited, Dunston, Gateshead: erection of new messroom accommodation at Oakwellgate, Gateshead

E. Davis (Fixers) Limited, York: erection of building to house chain annealing furnace at Stooperdale Works, Darlington; erection of covered area to forwarding line, Darlington Goods Depot

The High Commissioner for India invites tenders for steel wire for the Indian railways. Full details appear under Official Notices on page 195.

The Director General of Supplies & Disposals, Railway Stores Directorate, New Delhi, is inviting tenders for:—

1,560 axle boxes (c.s.) body 10 in. × 5 in. × 7½ in. × 2⅛ in. groove to part No. W.570 cast on side, liner to W-507, bottom cover to W-1602, top cover to W-1601 only welded on.

Tenders are to be submitted to the Director General of Industries & Supplies, Shahjahan Road (Section SRI), New Delhi, quoting reference SRI/16566-D/1 and will be received up to 10 a.m. on September 3.

The Special Register Information Service, Export Services Branch, Board of Trade, states that the Commercial Secretary to the British Embassy at Montevideo has reported that the Administracion de Ferrocarriles del Estado is calling for tenders for:—

500,000 steel dog-spikes, ¾ in. square section and 117 mm. in length between the point of the spike and the underside of the head

The dog-spikes are to be delivered in casks or sackcloth bags containing 50 kg. each. The closing date for the receipt of tenders is September 16. Attention is drawn to the necessity according to Uruguayan law of tenders being presented to State or municipal bodies by accredited local agents. No tenders may be made direct from the United Kingdom to official or semi-official Uruguayan organisations.

One copy of the specification No. C.M.447 (in Spanish) is available at Room 801 at Lacon House, Theobald's Road, W.C.1. This will be retained for inspection by representatives of United Kingdom manufacturers until August 20, after which date it will be available on loan to United Kingdom manufacturers. Reference ESD/412/53 should be quoted.

The Special Register Information Service, Export Services Branch, Board of Trade, states that the British Consulate General at Lourenço Marques has notified a call for tender (No. 106/53) issued by the Ports, Railways & Transport Department, Lourenço Marques, for the supply of the following:—

Two portable elevators for light and heavy cars working on air pressure of the type "Pneumatic Auto Lift," equipped with tubing, compensating valves and additional ramps for 2,500 kg.

Two hand-saws for cutting rails

100 hand-saw blades for above

Two hand machines for boring rails. (Sample or catalogue to be included)

27 road jacks of 15/20 tons. (Sample or catalogue to be included)

The closing date for the receipt of tenders is September 28. Tenders may be submitted only through firms established in Mozambique who are registered with the Stores Department of the Treasury (Almoxarifado de Fazenda), Lourenço Marques. A list of firms qualified to submit tenders on behalf of United Kingdom firms is obtainable from the above address. One copy of the tender document is available in Room 801, Lacon House, Theobald's Road, London, W.C.1. After August 20 it may be sent to United Kingdom firms in order of application.

The Special Register Information Service, Export Services Branch, Board of Trade, states that the United Kingdom Trade Commissioner at Johannesburg has notified a call for tenders issued by the South African Railways for the supply of one 3-4 ton diesel locomotive, 2 ft. gauge.

The locomotive is to be suitable for a track of 18 lb. rail, and is to have a maximum tractive effort at the wheels of not less than 1,600 lb., with a maximum speed of not less than 9 m.p.h. in either direction. The power unit is to be not less than 30 h.p. at 1,200 r.p.m. at sea level and an ambient temperature of 60° F. The final drive is to be arranged so that the power is distributed equally to the two axles. The locomotive chassis is to be mounted on springs, and must be capable of operating over a construction track with a minimum radius of 20 ft. The wheels are to be made of a high-grade cast steel. Mechanical brakes are to be fitted which shall be quick acting and arranged to equalise the braking efforts on all four wheels. The engine of the locomotive must be equipped with heavy duty oil bath air cleaners. Gearboxes are to be of the heavy duty type and must be arranged with constant mesh gears.

The locomotive is required to be in service at an early date, and quick delivery will be an important factor in consideration of tenders.

The closing date for the receipt of tenders is 9 a.m. on September 1. Tenders must be enclosed in a sealed envelope bearing the inscription "Tender No. B.6670 for Locomotives," addressed to the Chief Stores Superintendent, P.O. Box 8617, Johannesburg.

One set of the tender documents and full specification will be available on loan to United Kingdom firms in order of application.

WICKMAN BROTHERS LIMITED—Group net profits announced by Wickman Brothers Limited for the year to March 31 show a decline from £564,133 to £293,671. This was caused almost wholly by fluctuations in tungsten prices. The dividend on the ordinary stock is being maintained at 15 per cent.

Notes and News

Vacancy for Surveyor.—Applications are invited for the post of surveyor, required for the construction staff, East African Railways & Harbours, for one tour of 30 to 48 months in the first instance. See Official Notices on page 195.

Fares Increases Come into Effect.—On Sunday, August 16, the increases in London road and rail fares authorised by the Transport Tribunal on July 20 will come into effect. The increases, reported in our July 24 issue, affect London Transport and the London area lines of British Railways; and early morning fares and season tickets on British Railways throughout the country.

Braithwaite & Co. Engineers Ltd. Results.—A final ordinary dividend for the year ended March 31 of 3½ per cent has been recommended, maintaining the total distribution for the year at 7½ per cent. Group net profits were £17,814 after all deductions including £48,986 for income tax, which includes a further provision for past years of £12,500. Dividends required £14,673.

Senior Draughtsman Required.—Applications are invited for the post of senior draughtsman, civil engineering, required by the Nigerian Government Railway for one tour of 18 to 24 months in the first instance. Candidates must have experience in preparation of design and working drawings for railway track layouts and construction works, retaining walls, drainage and water supply schemes. See Official Notices on page 195.

Luncheon to North Eastern Region Mayors.—Mr. H. A. Short, Chief Regional Officer, on July 28 entertained to luncheon at York members of the North Eastern Region staff elected to civic office. The accompanying illustration shows Mr. Short (front row, centre) with (back row, left to right) Messrs. E. W. Arkle, Commercial Superintendent; C. Cooper, Regional Staff Officer; A. P. Hunter, Divisional Operating Superintendent; (middle row, centre) Mr. K. J. Cook, Mechanical & Electrical Engineer, E. & N.E. Regions; and (on his left) Mr. E. W. Rostern, Operating Superintendent, E. & N.E. Regions.

Wighton Halt Conversion.—On and from August 31, 1953, the issue of tickets and collection of fares for journeys to and from Wighton Halt, Eastern Region, will be dealt with at either Wells-on-Sea or Fakenham East stations or at the nearest junction station. Applications for season tickets should be made at Walsingham station or at the station to which the ticket is required to be made available.

Vacancies in London Transport.—Applications are invited for the following posts, required by London Transport:—Two engineering assistants, bridges and structures drawing office; technical assistant, civil engineering section, to undertake surveys, design and preparation of drawings and specifications related to constructional work; engineering assistant and technical assistants for signalling work; engineering assistant and technical assistants for telephone work; general technical assistants to prepare drawings of equipment and components for railway power signalling. See Official Notices on page 195.

Rail Connection Advocated for London Airport.—A letter to *The Times* of August 8 from Mr. A. C. Ping, Member of the Board of British European Airways has drawn attention to the large number of airline coaches required to serve modern high-capacity aircraft using London Airport, with consequent congestion of the Great West Road and expensive delays. He comments that the future demand to and from the airport must surely be for bulk transport, and the most efficient means for moving bulk loads, be they passengers, baggage, or freight, will always be the railway. He would like to see London Airport served by rail, either by an extension of the Underground system or by a spur off the Southern Region line into Waterloo. By this means he estimates that the journey could be cut to 25 min., with fares and classes to meet all requirements.

Mr. H. A. Short, Chief Regional Officer, with officers of the North Eastern Region and members of the staff elected to civic office

Doncaster Works Centenary.—The general public is to be given an opportunity of visiting the locomotive works and carriage & wagon works at Doncaster to mark the 1953 centenary on September 19, 20 and 24. An exhibition including old and modern locomotives, models, items of historical interest, photographs, curios and documents has been arranged. A works centenary service will be held at St. James Church on Sunday, September 20.

Awards to L.M.R. Railwaymen for First Aid.—Mr. A. E. Hammett, Commercial Superintendent, London Midland Region, made presentations on August 4 to eight railwaymen for meritorious work in rendering first aid to other members of the staff and to the public. The recipients included a signalman, goods clerk, goods guard, and locomotive fitter. Among the incidents for which the awards were made were accidents involving first aid treatment for a fractured spine, and a severed foot.

Diesel Train in Birmingham Area.—Experimental services with the A.C.V. lightweight three-car diesel train will be operated by the Western Region in the Birmingham area from August 17. The train will run mainly from Birmingham Moor Street to Solihull and Henley-in-Arden, and will also make a return trip to Wolverhampton. Passengers' views of the services will be collected by means of questionnaire forms. The A.C.V. train was described and illustrated in our May 30, 1952, issue.

Channel Tunnel Co. Ltd.—The report of the Channel Tunnel Co. Ltd. for 1952, presented at the annual meeting on August 10, showed a net profit of £542, bringing the revenue reserve to £10,325. The Chairman, Mr. Leo d'Erlanger, said in reply to a shareholder's question that the company had only moral rights in the eventuality of another group considering the idea of another tunnel in a different position. There was every reason to suppose, however, that their original site was still the best for the shortest and easiest tunnel between England and France.

B.T.C. Charges Scheme Postponed.—The Minister of Transport, Mr. Alan Lennox-Boyd, has granted the application of the British Transport Commission under Section 76 of the Transport Act, 1947, as limited by Section 20 of the Transport Act, 1953, for a further period of two years from August 6, 1953, for preparation and submission to the Transport Tribunal of the Commission's draft charges schemes. A passenger charges scheme is already in force, but the further period of two years is required for preparation and submission of draft schemes relating to other charges in view of the changes effected by the Transport Act, 1953, particularly those affecting the nature and content of charges schemes.

"Royal Scot" Coaches Derailed.—Seven of the rear coaches of the down "Royal Scot" were derailed near Abington between Beattock and Carstairs, at 5.32 p.m. on August 8. Three of the coaches overturned. There were 29 casualties among passengers, mostly the result of cuts, minor bruises, and shock. Ten passengers were treated on the spot. Of the 19 taken to hospital, 12 were able to go home after treatment. The front portion of the train was able to proceed after the accident and

OFFICIAL NOTICES

The engagement of persons answering Situations Vacant advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 *inclusive, or a woman aged* 18-59 *inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order,* 1952.

SURVEYOR required for the Construction Staff, EAST AFRICAN RAILWAYS AND HARBOURS, for one tour of 30 to 48 months in first instance. Commencing salary, etc., according to experience, fixed between £923 and £1,053 a year, plus a construction allowance up to 20% of basic salary. Free passages and quarters. Liberal leave on full basic salary. Gratuity. Candidates should have had experience of traversing triangulation, levelling, tacheometry, plotting and computing, setting out of embankments and cuttings also measuring of earthworks. They must be capable of using all normal survey instruments. Write to the CROWN AGENTS, 4, Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M2B/29871/RA.

THE High Commissioner for India invites tenders for the supply of: Various types of Steel Wire for Indian Railways. Quantity: 118 tons 12 cwts. Forms of tender may be obtained from the Director-General, INDIA STORE DEPARTMENT, 32-44, Edgware Road, London, W.2, at a fee of 10/- which is not returnable. Tenders are to be delivered by 2 p.m. on Friday, 9th October, 1953. Please quote reference No. 60/53 in your application.

N.E.R. HISTORY.—Twenty-Five Years of the North Eastern Railway, 1898-1922. By R. Bell, C.B.E., Assistant General Manager, N.E.R. and L.N.E.R. Companies, 1922-1943. Full cloth. Cr. 8vo. 87 pages. 10*s.* 6*d.*—*The Railway Gazette*, 33, Tothill Street, London, S.W.1.

LONDON TRANSPORT require in Signal Engineer's Office:—(*a*) Engineering Assistant and technical assistants for signalling work. Preparation of signalling plans, wiring diagrams, cable charts and drawings. (*b*) Engineering Assistant and technical assistants for telephone work. Applicants should have had training in knowledge and experience of automatic and manual telephone systems. (*c*) General technical assistants to prepare drawings of equipment and components for railway power signalling: should have drawing office experience. Applicants for Engineering assistant posts should possess Higher National Certificate in electrical engineering. For general technical assistant posts applicants should possess ordinary National Certificate in electrical or mechanical engineering. Salary range Engineering Assistant, £599 to £679 with prospects of advancement to £739: commencing salary according to qualifications and experience. Technical Assistants £324 at 21 to £579 subject to age and satisfactory service with additional payments for certain recognised qualifications. Medical exam.; contributory superannuation scheme after probation. Applications within 14 days to STAFF OFFICER (F/EV.250 (*a*), (*b*), or (*c*)), London Transport, 55, Broadway, S.W.1. For acknowledgment enclose addressed envelope.

THE PERUVIAN CORPORATION have the following vacancies on the railways in Peru:—Central Railway. ACCOUNTANT (Traffic Auditor). About 30 years of age, preferably single with general auditing and railway accounting experience. Northern Railways. DIESEL ENGINEER with practical experience on diesel locomotives and railcars and workshop management. Southern Railway. ASSISTANT CHIEF STOREKEEPER—an experienced Railway Storekeeper with a knowledge of Spanish essential. GUAQUI LA PAZ RAILWAY—ASSISTANT ACCOUNTANT—Qualifications: man who has passed Intermediate Examination of recognised accountancy body preferred. Knowledge of railway accounts an advantage. Preferably single between 28/35 years of age. A knowledge of the Spanish Language is preferable in all these appointments or willingness to learn within 6 months. Apply: SECRETARY, 144, Leadenhall Street, London, E.C.3.

LONDON TRANSPORT require:—(*a*) Two Engineering Assistants, Bridges and Structures drawing office. Applicants preferably chartered civil or structural engineers, experienced in design and execution of bridge work in steel or concrete and general structural engineering. Salary range £599 to £679 with prospects of advancement to £739: commencing salary according to qualifications and experience. (*b*) Technical Assistant, civil engineering section to undertake surveys, design and preparation of drawings and specifications related to constructional works. Salary range £324 at 21 rising to £579 subject to age and satisfactory service: additional payments for certain recognised qualifications. Medical exam.; contributory superannuation scheme after probation. Applications within 14 days to STAFF OFFICER (F/EV.248 (*a*) or (*b*)), London Transport, 55, Broadway, S.W.1. For acknowledgment enclose addressed envelope.

SENIOR DRAUGHTSMAN (Civil Engineering) required by the NIGERIAN GOVERNMENT RAILWAY for one tour of 18 to 24 months in first instance. Salary, etc., in scale £1,170 rising to £1,453 a year. Gratuity £150 a year. Outfit allowance £60. Free passages for officer and wife and assistance towards cost of children's passages or their maintenance in this country. Liberal leave on full salary. Candidates must have extensive experience in preparation of design and working drawings for railway track layouts and construction works, retaining walls, drainage and water supply schemes. Write to the CROWN AGENTS, 4, Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M2B/29981/RA.

BEARINGS: 250 brand new Timken taper roller bearings 598/592 for sale, new stock, surplus to requirements. Box 905, *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

BOUND VOLUMES.—We can arrange for readers' copies to be bound in full cloth at a charge of 25*s.* per volume, post free. Send your copies to the SUBSCRIPTION DEPARTMENT, Tothill Press Limited, 33, Tothill Street, London, S.W.1.

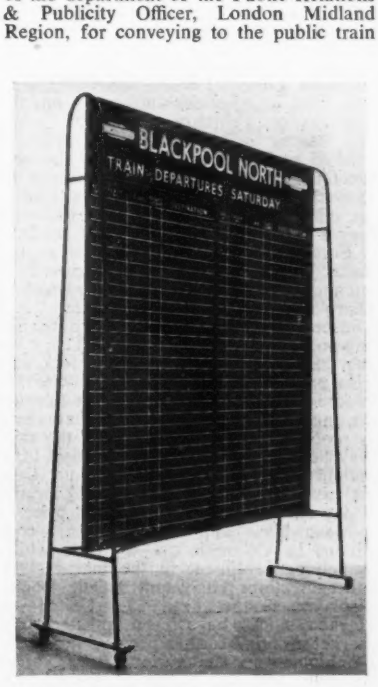
reached Glasgow 4 hr. late. Both tracks were reopened to traffic just after 7 p.m. on August 9. A Ministry of Transport inquiry opens at Glasgow today (Friday).

Sheepbridge Engineering Co. Ltd.—There was a decline from £372,126 to £305,522 in the group net profits of the Sheepbridge Engineering Co. Ltd. for the year ended March 31 last. Excluding the minority interest, the net profit of £298,164 compared with £362,041 in the previous year. The directors recommend a final dividend for the year ended March 31 last of 12½ per cent, less income tax, making a total of 17½ per cent, less income tax, for the year.

Exhibition of Arc Manufacturing Company Products.—The Arc Manufacturing Co. Ltd. will exhibit at Actarc Works, London, W.12, during the middle of September, a full range of Actarc electrodes and the welding plant now available, besides special plant built to customers' orders and incorporating features of general interest. Visitors will be able to test and examine all products in the company's welding laboratory. The plant shown will include air-cooled and oil-cooled welding transformers; a.c. and d.c. Argon arc plants; and a.c. and d.c. diesel-driven welding plants.

Buses Return from Continental Tour.—Two London Transport double-deck buses, which had been on a visit to Switzerland and Sweden, arrived back in London on August 7 and were welcomed by Mr. L. C. Hawkins, Member of the London Transport Executive. The buses were displayed during the "British Week" at Zurich from June 19 to 28 and subsequently at a similar event in Malmo from July 23 to August 2. Between these two displays the buses were used in normal passenger service in Zurich, Geneva, Lucerne, and St. Gallen. The tour was completed without mechanical trouble and there is every indication that revenue from passengers and advertisers during the periods of Continental operation will have made the venture a financial success.

Portable Train Departure Indicator.—The blackboard fitment illustrated below has been provided to meet the requirements of the department of the Public Relations & Publicity Officer, London Midland Region, for conveying to the public train departure information on Saturdays at Blackpool North, where during the summer the traffic is exceptionally heavy. The fitment was constructed by the Partington Advertising Co. Ltd. to department requirements.



Blackboard for display of excursion train departures and platforms at Blackpool North, L.M.R.

Special Trains for Scottish Football.—British Railways provided 20 special trains for the opening games of the Scottish football season on August 8. The largest number was run to Parkhead for the Celtic versus Aberdeen League Cup match at Celtic Park, six from Glasgow Central Low Level and Glasgow Cross, and two from Coatbridge and other Lanarkshire stations.

Gloucester Railway Carriage & Wagon Co. Ltd.—The directors of the Gloucester Railway Carriage & Wagon Co. Ltd. announce that the response to their offer to the outside shareholders of Hatherley Works Limited, dated July has been satisfactory, and that they are proceeding to complete the exchange. The acquisition proposal was reported in our July 17 issue. The directors further state that the offer will be extended until September 1 next, so that those members of Hatherley Works Limited who have not yet accepted may have an opportunity to do so on the same terms.

Oldham & Son Limited.—The statement by Mr. John Oldham, Chairman of Oldham & Son Limited, circulated with the report and accounts for the year to March 31, draws attention to an increasing demand for the company's products. Road transport vehicles of all kinds, it says, were being used in increasing numbers, with obvious advantage to the automobile battery side of the company's activities. An increasing contribution to industrial activities of all kinds was also being made by storage batteries, which were required for purposes as diverse as lighting and for the remote automatic operation of switch and

relay equipment. Since publication of the last report, all Oldham automobile and passenger transport batteries had been changed over to use the new Fibrak battery separator. The consolidated profit and loss account in the report shows a net profit for the year of £262,541 as compared with £319,706 in the previous year. The balance of £109,247 compares with £132,344 a year ago.

George Spencer, Moulton & Co. Ltd.—Payment of a 10 per cent. dividend, less tax, amounting to £14,740, is announced in the annual report of George Spencer, Moulton & Co. Ltd. Net profit for the year showed a decrease of £35,011. The fixed assets reserve was allocated £20,000 and general reserve, £23,130.

Measuring and Indicating Instruments.—A comprehensive range of indicating and measuring instruments will be exhibited by Smiths Industrial Instruments Limited at the Engineering & Marine Exhibition to be held at Olympia, London, September 3-17. The equipment includes generators for chain or gear drive, the heavy industrial Desynn remote indicating equipment in flameproof housing, tachometer for time and motion study, and David Harcourt pressure gauges.

Works Excursion to Crewe.—An assembly line of new standard locomotive in various stages of construction and several types preserved from the early days of railways will be seen by passengers participating in an excursion from Euston on August 20 for a tour of Crewe Works. One of the historical locomotives to be shown is the *Lion* of 1838, which is well known for having featured in various British films. The train, with refreshment facilities, will run direct into the works, where guides will conduct the visitors through the various shops of what is the biggest railway-owned locomotive works in the world. The return fare is 20s. 6d.

French Railway Strike.—The strike, mainly of enginemen of the French National Railways, which began last week, with a measure of return to work at the end of the week, was renewed on August 10. Large numbers of S.N.C.F. staff were on strike as we went to press, and the system was immobilised. No trains had left Paris termini after the morning of August 11. On that day British Railways recommended tourists not to travel to France unless they could stay at, or travel by road from, French ports still accessible, but most cross-Channel services were maintained. In a statement on August 12, this advice was repeated. British Railways added that they hoped to arrange inwards sailings to convey tourists who had been able to make their way to French ports; some outwards services, therefore, might have to be cancelled.

Firth Brown Tools Limited.—A statement by Lord Aberconway, Chairman of Firth Brown Tools Limited, records a profit for the year 1952-53, before taxation, of £418,507. Provisions for taxation absorbed 67 per cent of the total profit for the year. The value of orders received had fallen substantially during the latter part of the year, which had enabled outstanding orders to be cleared in the case of most of their products. Much quicker deliveries were constantly being quoted and effected. A reduced level of demand, both at home and abroad, must be expected for some time because customers and stockists held considerable quantities of all types of standard tools, but the board believed that, provided market conditions for their products did not further deteriorate, profits should continue to be earned. A large sum, £128,572, had again been spent on new buildings and plant.

New Skye Ferry Vessel Ordered.—The Scottish Region announces that a new combined passenger and vehicular ferry vessel is to be built for the Kyle of Lochalsh-Kyleakin (Isle of Skye) service; the order has been placed with Wm. Denny & Bros. Limited, Dumbarton. The new vessel will be of a similar type to the *Portree*, also built by Wm. Denny & Bros. Limited, which went into service between Kyle of Lochalsh and Kyleakin in April, 1952. It is designed to carry four motorcars, and will have covered accommodation for 30 passengers. Two Gleniffer four-cylinder 80-h.p. high-speed diesel engines, providing a speed of about 9 knots, will be controlled from the steering position above the passenger accommodation.

Forthcoming Meetings

August 19 (*Wed.*) to August 29 (*Sat.*).—Model Engineer Exhibition at the New Horticultural Hall, Westminster, London, S.W.1.

Railway Stock Market

Values both in the industrial and gilt-edged sections have again moved in favour of holders, and the volume of business, although moderate, has been better than usual at this time of the year when it is held in check by holiday considerations. British Funds continued to be helped by the unexpectedly good increase in the gold and dollar reserve figures for the past month.

Sentiment in regard to industrial shares has been assisted by the latest trade returns and by the many indications that, although competition in export markets is increasing substantially, British industry is making renewed efforts and will benefit in the current half year from relaxation of import controls by Australia. Moreover, the assumption is that the majority of industrial companies have good prospects of maintaining their dividends, and at current prices attractive yields are still shown in many instances. In fact it is being widely assumed that markets will advance strongly in the autumn. A pointer that good markets are looked for is said to be the fact that the first of the big steel issues is planned for the early autumn. This issue is generally expected to be by either Stewarts & Lloyds or Dorman Long. Former shareholders in the steel companies who were on the registers on February 15th, 1951, when the shares were nationalised, will be offered preferential allotment in the new steel issues. Moreover, a wide range of Government securities will be available to be offered in exchange for steel shares at prices fixed when the issues are made.

Foreign rails have participated in the better market trend and developed a number of good features, among which a sharp advance in Mexican Central "A" and bearer debentures to 81 was outstanding and was attributed partly to U.S. buying. Dorada Railway ordinary stock was also prominent, advancing strongly to 58, before easing slightly to 57 at the time of writing. The market realises that there is probably no early prospect of the railway being taken over, but recognises that, should there be a take-over as time proceeds, the ordinary stock would receive a pay-out well above the current price.

Meanwhile, improved political conditions in Colombia are a factor which is helping sentiment in the market. In other directions, Guayaquil & Quito bonus displayed firmness at 37½. United of Havana stocks have been an uncertain market awaiting further news of take-over developments. The various stocks, after receding, attracted buyers at the slightly lower levels. At the time of writing the 4 per cent "A" is 66, the "B" 65, the second income stock 22½ and the consolidated stock 3½. There was less activity in Manila Railway issues; the "A" debentures were 78 and the preference shares 8s. Brazil Rail bonds marked 6⅛. Taltal Railway shares changed hands around 14s. 3d. and Nitrate Rails shares were 20s. 9d. In other directions, Antofagasta ordinary stock was firmer at 9 with the preference stock 42½xd. Speculative buying of old Russian railway bonds remained in evidence; Black Sea-Kuban and Russian South Eastern both showed business up to 20s. Elsewhere, San Paulo ordinary units were 5s. 3d.

Canadian Pacifics have been firm at $47⅞, while the preference stock strengthened to £66½ and the 4 per cent debentures to £85⅛. Canadian securities generally have been helped by the result of the Canadian election. White Pass no par value shares, however, have eased to $28¼ at the time of writing, while the convertible debentures, after improving, eased to £100. Among home stocks, Central London Guaranteed marked up to 80, and Metropolitan Assented was dealt in around 44¼. Elsewhere among Australian stocks, Emu Bay 4½ per cent debentures were dealt in up to 55.

Engineering and kindred shares remained more active though best levels have not been fully held at the time of writing. Guest Keen at 51s. 6d. lost part of an earlier good rise, while Vickers eased to 50s. 3d. on market talk that, if it is decided to reacquire the former big interest in the English Steel Corporation, Vickers might have to raise more capital. Nevertheless, should this prove the case, it is thought in the market an issue would take the form of an offer of additional shares to shareholders on favourable terms. Babcock & Wilcox moved higher at 66s. 6d. John Brown were up to 36s. 6d. prior to the dividend announcement. John Brown, is, of course, another engineering company which must decide whether to repurchase its former steel interests.

T. W. Ward have shown firmness at 73s. 9d., but elsewhere, Tube Investments at 59s. 6d. failed to hold all an earlier rise. Ruston & Hornsby strengthened to 41s. on the full results and chairman's annual statement. George Cohen 5s. shares have been firm at 9s. 9d. and British Aluminium at 40s. were higher on balance. Among shares of locomotive builders and engineers, Beyer Peacock were 34s., and Charles Roberts 5s. shares 16s. 4½d. Hurst Nelson were 40s., Birmingham Carriage 28s. 3d. and North British Locomotive 12s. 3d. Vulcan Foundry kept at 20s. 6d. Gloucester Wagon 10s. shares moved higher at 13s. 6d. and Wagon Repairs 5s. shares were 13s. Road Transport shares have been firm again with B.E.T. deferred stock active around 29s. 6d. in its new form of 5s. units.